# SEXUAL RISK BEHAVIORS OF MEN WHO HAVE SEX WITH MEN IN VIET NAM

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A dissertation submitted to the faculty of the University of North Carolina at Chapel Hill in partial fulfillment of the requirements for the degree of Doctor of Philosophy in the Department of Epidemiology in the Gillings School of Global Public Health.

Chapel Hill
2010

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## ABSTRACT

QUOC CUONG NGUYEN: Sexual Risk Behaviors of Men Who Have Sex with Men in Viet Nam.
(Under the direction of Victor J. Schoenbach)

Men who have sex with men (MSM) are a vanguard population in the HIV epidemic, but there are limited data about MSM in Viet Nam. We conducted two surveys, using the same questionnaire but two different sampling strategies, to examine sociodemographic characteristics, sexual identities, and key indicators of HIV risk among Vietnamese MSM.

The network recruitment survey, June-October 2008, employed respondent driven sampling (RDS) among MSM in Ha Noi, Viet Nam. 402 MSM self-administered a questionnaire. The population accessed in the RDS survey was mostly young (75.9% were under 25 years old), and well-educated (60.3% had attended some college). 56.2% self-identified as gay, 15.2% as bisexual, and 11.6% as "straight". About one-fifth had ever been paid for sex with a man. The proportions of men practicing consistent condom use with different types of male partners were 45-50%. One-third of men were able to give correct answers to five questions on HIV transmission and prevention. Only 31% of the men considered themselves at risk of HIV.

The Internet-based survey, conducted November 2008 to February 2009, recruited Vietnamese MSM through gay websites. A total of 2,640 respondents provided complete sociodemographic information. 62.9% were younger than 25 years; nearly 80% had attended some college. 63.4% self-identified as gay and 17.7% as bi-sexual. 39.8% of men who had anal intercourse with other men during the past 6 months did not use a condom during the last anal sex, especially if they did not think they were at risk of HIV (relative risk (RR): 1.4; 95%CI: 1.1-1.6) and/or if the partner was a regular partner (RR: 1.5; 95%CI: 1.2-1.9).

Compared to the Ha Noi MSM recruited through network sampling, respondents to the Internet survey had more education and income, better knowledge of HIV, and higher personal risk perception.

Results of this study provide detailed sociodemographic information about MSM in Viet Nam and confirm that many are at high risk of HIV. HIV prevention interventions for MSM should be scaled up and possibly conducted in partnership with MSM websites.

To the memory of my Mother, Le Thi Quynh

## ACKNOWLEDGEMENTS

I am greatly indebted to my supervisor, Professor Victor J Schoenbach, for his tremendous guidance, strong support, and great patience in the last four years. Without Professor Victor J. Schoenbach, this dissertation project would not have been carried out.

I would like to express my gratitude to the members of my dissertation committee: Trude A. Bennett, Audrey E. Pettifor, William D. Kalsbeek, and William C. Miller for their many invaluable comments, which I often requested on very short notice.

I would like to thank the “know-it-all-person” Nancy Colvin, who did tons of paper procedures and exchanged hundreds of emails regarding matters related to me. Without her, I would not have been able to stay in this program.

My special thanks to Huynh Lan Phuong, Le Quang Binh, and all the staff of the Institute for Studies of Society, Economy, and Environment in Ha Noi, who supported my research ideas, got the proposal funded, and helped me throughout the data collection process.

Many thanks to administrators and members of five web forums for men who have sex with men in Viet Nam, individuals and groups in the community of men who have sex with men in Ha Noi and Ho Chi Minh City, who supported and participated in the study.

I would like to thank to Nguyen Cong Nghia, Pham Bao Yen, Nguyen Thanh Tuan, Kim Angelon, Leah Schinasi, Kimberly Porter, and all of my dear classmates and friends who have always eased my concerns and comforted me and helped to make Chapel Hill my home away from home in the past years.

Many thanks must be expressed to Nguyen Thi Thanh, who gave me unlimited and unconditional support; and to my long-time friends, Phan Huu Phuc, Luong Thi Tam, Duong Cong Thanh, Dang Hoang Thai, and Le Ba Quynh, who always give me a hand whenever I need.

I would like to acknowledge the Viet Nam Education Foundation, UNC Department of Epidemiology, GlaxoSmithKline, MERCK, and UNC Graduate School for financial support.

Last but not least, I want to say thank you to my family: my Father Nguyen Van Quy, my sister Nguyen Thi Ngoc Quyen and her husband Nguyen Huu Hai, my lovely niece Nguyen Hai Anh, and my cute nephew Nguyen Huu Hai Long. I am

sure that they are all proud of my achievement. It is to the memory of my Mother Le Thi Quynh that I dedicate this work.

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| | |
|---|---|
| AIDS | Acquired Immunodeficiency Syndrome |
| CI | Confidence Interval |
| HIV | Human Immunodeficiency Virus |
| IBBS | Integrated Biology Behavior Surveillance |
| MSM | Men Who Have Sex With Men |
| PEPFAR | President's Emergency Plan for AIDS Relief |
| PR | Prevalence Ratio |
| RDS | Respondent Driven Sampling |
| RDSAT | Respondent Driven Sampling Analysis Tool |
| STI | Sexual Transmitted Infection |

## CHAPTER I: BACKGROUND

Viet Nam is located in Southeastern Asia, bordering the Gulf of Thailand, Gulf of Tonkin, South China Sea, China, Laos, and Cambodia [1]. Viet Nam has a population of 85.2 million people. The mean age of Vietnamese is 26.4 years. Viet Nam's annual economic growth rate of 8% is the second highest in the world. However, one fifth (19.5%) of the population lives in poverty (income under 1 USD per day). Although Viet Nam is still a developing economy, more than 90% of Vietnamese aged 15 years and older can read and write. Viet Nam has more than 70 million mobile phone registered numbers and 21 million Internet users [1].

Viet Nam is a country with a high risk of infectious diseases, including avian flu (H5N1), bacterial diarrhea, and HIV [1]. The government of Viet Nam and the international community have demonstrated their commitment to combat the HIV epidemic in Viet Nam. The HIV program is the biggest program for a single disease in the country. Viet Nam is one of 15 focus countries under the President's Emergency Plan for AIDS Relief (PEPFAR) which provides more than 90 million USD per year for HIV control and prevention [2].

The first HIV case in Viet Nam was reported in 1990 [3]. It is projected that there were around 300 000 people living with HIV in Vietnam at the end of 2007, with a male-to-female ratio of 2:1 [4]. Estimated HIV prevalence in people age 15-49 years is 0.55%. It is projected that there are around 37 000 - 40 000 new HIV infections in Viet Nam each year. The epidemic is still in a concentrated stage, meaning that it is largely focused in most at risk groups such as injecting drug users, men who have sex with men and female sex workers. Ho Chi Minh City, the largest city of the country (population of 8 million), is the center of the epidemic. With HIV prevalence among people aged 15 to 49 years of 1.2% in 2007, the city is home to a quarter of all people living with HIV in Viet Nam. Ha Noi, the capital city (population of 3.5 million), is among three most affected areas with HIV prevalence among people aged 15 to 49 years of 0.9% [4]. HIV infections have been reported from all 63 provinces/cities in Viet Nam.

**1.1 Men who have sex with men in Viet Nam: a neglected population**

Though male-to-male sexual behavior is not illegal in Viet Nam, talking about it is still a taboo. Many men who have sex with men (MSM) deprecate themselves and think of their sexuality as a sickness or bad fate[5]. Homosexuality is definitely not considered to be a normal or acceptable lifestyle, and the majority of Vietnamese homosexual men keep their sexual orientation secret, and either intend to marry or actually married [5]. In the Viet Nam Population AIDS Indicator Survey, a household survey of 60 000 people conducted in 10 provinces in Viet Nam in 2004, there was only one man who reported that he had ever had sex with a man [6].

One of the first studies of MSM in Viet Nam recruited 219 informants from a variety of venues where MSM meet, including bars and cafes (40%), discos and parks (25%), saunas (1%), swimming pools (5%), brothels (4%), cinema and barbershops (1%). The study also recruited participants (20%) using the snowball technique and from other referrals [7]. Another study in Ho Chi Minh City in 2007 recruited 600 MSM in 72 venues including parks, bars, and swimming pools [8]. The HIV/STI Integrated Biological and Behavioral Surveillance (IBBS) project in Vietnam in 2005-2006 attempted to recruit its sample through Respondent Driven Sampling, but ended up recruiting primarily from MSM visiting their intervention centers [9].

These studies reported that MSM in Viet Nam have poor knowledge about HIV and practice behaviors putting them at high risk of HIV infection. The IBBS reported that large percentages of MSM reported having multiple sexual partners (43% in Ha Noi and 70% in Ho Chi Minh City) and/or exchanging sex for money (almost 22% in Ha Noi and 35% in Ho Chi Minh City). HIV prevalence in MSM in Ha Noi and Ho Chi Minh City was found to be 9.4% and 5.3%, respectively [9]. The IBBS found that only 45% of MSM in Ha Noi and an even smaller percentage (19%) of MSM in Ho Chi Minh City have a correct understanding about HIV prevention methods. The IBBS also reported that among MSM in Ha Noi who had paid for sex with another man during the previous month, only 4.3% regularly used a condom during these encounters. Other studies have also found poor knowledge about HIV transmission and prevention among MSM in Ho Chi Minh City [7,8].

If researchers recruit MSM who are in some way more visible than others, certain groups of MSM are likely to be overrepresented. The IBBS reported that 33.9% of MSM in Ho Chi Minh City self-identify as straight men. The study in Ho Chi Minh City by Nguyen et al. [8] reported that 76.6% of their sample in Ho Chi Minh City were bisexual men but a previous study in Ho Chi Minh City [7] reported 31% bisexual men. A study in Khanh Hoa also reported approximately 50% bisexual men among MSM[10].

Similarly, very large percentages of Vietnamese MSM in past studies have reported buying or selling sex. For example, more than 50% of MSM in the Colby (2003) study had ever been involved in sex trading activities [7]. More than one-third of MSM in the Nguyen (2008) study reported that they had ever sold sex [8]. Almost 22% and 35% of IBBS respondents in Ha Noi and Ho Chi Minh City, respectively, reported that they had ever sold sex [9]. Another concern with these studies is the possibility that condom use or HIV intervention accessibility might have been overreported due to social desirability influences [9].

Despite the high HIV prevalence among MSM, there is relatively low investment in HIV prevention activities for MSM. In the Vietnam National Strategy for HIV/AIDS till 2010, even though MSM are identified as one of the most at-risk populations in Vietnam, there is neither a specific plan of action for MSM nor a separate budget line for MSM prevention efforts. A part of the reason is the lack of

information about this population, such as population size, sociodemographic characteristics, risk behaviors, and factors associated with those behaviors

Studies of risky sexual behaviors of MSM, conducted around the world since the beginning of the HIV/AIDS epidemic, have found that such behaviors are associated with age, education, preference for receptive anal sex, substance use during sexual encounters, gender nonconformity, low self-esteem, internalized homophobia, perceived stigma, and lack of social support [11-19]. However, associations of these factors with risk behaviors vary by culture and context [11,20] .

**1.2 Sampling methods in studies of hard-to-reach populations**

A key problem in studying hard to reach populations such as MSM is to identify or create a sampling frame, since there is no way to enumerate the members of the population. Several alternatives to probability sampling have been used, including time-location sampling, targeted sampling, and chain recruitment methods such as the snowball technique. However, none of these recruitment methods yields a probability sample, so the resulting samples are not statistically representative.

In the past several decades, researchers have turned to a new sampling technique – respondent driven sampling (RDS) – to obtain probability samples from hard-to-reach populations [21]. RDS is a method of referral sampling which involves asking individuals to refer people in their community/social networks to the survey.

These respondents, in turn, refer others. Similar to snowball recruitment, this continuous community/network recruitment creates sampling chains in populations that would have been difficult to reach using traditional sampling efforts. The advantage of RDS versus conventional chain-referral methods is that RDS allows for the assessment of inclusion probabilities for members of the population based on a mathematical model of the recruitment process. Also a limit is imposed on the number of participants any one participant can refer, so that the sample will not be dominated by participants with larger networks [21-25].

RDS has been successfully applied to recruit MSM in several countries [26,27]. These studies have shown that compared to conventional sampling methods, RDS was quicker, cheaper, and easier for recruiting this hidden population [26,28]. However, partially due to logistical issues, RDS is difficult to implement in a large geographical scale.

Although it does not yield a probability sample, recruitment over the Internet may be an effective and logistically efficient means of recruit MSM for national studies of HIV-related behavior [29-31]. Many MSM use the Internet to seek their sexual partners. MSM who do are probably more available to studies that recruit via the Internet, and there are differences in frequency of high risk behaviors between MSM who seek partners via the Internet and MSM who do not [32-37].

We are not aware of any published Internet survey on HIV behaviors in Viet Nam, including surveys of the MSM population. However, Internet recruitment appears feasible, as Internet access has been dramatically increasing in Viet Nam. By June 2009, there were 21.5 million Internet users in Viet Nam, accounting for approximately one-fourth of the population [38]. Furthermore, one study in a rural area in Viet Nam showed that 30% of MSM there have ever sought a sexual partner via the Internet.

Therefore, we designed a study on sexual behaviors of MSM in Viet Nam which consists of two parallel surveys, a face-to-face survey in a sample recruited via RDS and an Internet-based survey of self-identified volunteers, in order to provide basic descriptive data on Vietnamese MSM and their risk behaviors, as well as to examine possible determinants of these behaviors including psychological variables such as self-esteem, social support, concealment of homosexuality and stigma.

We hoped that RDS method would enable us to recruit a more representative sample of MSM in Ha Noi, providing a better picture of sociodemographic characteristics and sexual behaviors of Vietnamese MSM in the capital city and that the Internet-based survey would provide a national, although not statistically representative, picture of MSM across Viet Nam. Results of our study will be used for advocacy to urge government and donors to address the needs of the MSM

population. Results will also be used for better planning of HIV prevention programs for MSM.

# CHAPTER II: SPECIFIC AIMS

The specific aims of the study were:

## 2.1 Specific Aim 1

To describe key sociodemographic characteristics of the MSM population in Viet Nam.

### Rationale

It has been a common belief that most MSM in Viet Nam are male sex workers or injecting drug users. It has also been assumed that MSM are transgender or transsexual men who exhibit feminine manner and behaviors. These preconceptions have received some support from the few previous studies on MSM in Viet Nam [7-9] . Furthermore, there has been no quantitative estimate of the number of MSM in Viet Nam. As a result, the national authorities have not thought that there is a sizable MSM population in Viet Nam and therefore there is no need for HIV prevention interventions targeting MSM. However, there is evidence that MSM behaviors exist in every society, and the MSM population plays an important role in the spread of the HIV epidemic in the world. A better understanding of the sociodemographic characteristics of this population, knowing who they are and where they live, will help to advocate for and to plan HIV preventions for MSM in Viet Nam.

### 2.2 Specific Aim 2

To describe the frequency of unsafe sexual behaviors among MSM in Viet Nam.

2 a. To compare sexual behaviors of different MSM groups (e.g., men who visited MSM venues and men who did not, men recruited via the Internet and those recruited by RDS).

2 b. To examine factors associated with unsafe sexual behaviors.

### Rationale

Data on the prevalence of sexual risk behavior are essential for gauging the potential for HIV dissemination among MSM and between MSM and other population groups. Prevalence data are also necessary for monitoring the impact of HIV prevention interventions. The few studies that have examined the sexual behavior of MSM in Viet Nam have found a high prevalence of risky behavior. However, the sampling methods and local scale of those studies limit the generalizability of their results. A national, probability-based survey of sexual behaviors of the Vietnamese MSM population could help to predict the future course of the HIV epidemic. In addition, knowledge of factors associated with unprotected anal sex, the key mode of sexual transmission among MSM, is helpful for formulating prevention programs directed to MSM. It was hypothesized that poor knowledge of how to avoid acquiring HIV and low personal HIV risk perception are associated with engaging in risky behaviors.

# CHAPTER III: METHODS

## 3.1. Study design

Data were collected through two surveys. Except for minor differences, both surveys addressed both specific aims and used the same questionnaire. The first survey used RDS to recruit participants in Ha Noi. The second survey recruited volunteers through six gay websites.

## 3.2 Survey recruitment and administration – Respondent Driven Sampling survey

### 3.2.1 Study site

The RDS survey was conducted in Ha Noi from 8 June 2008 to 8 October 2008. Participants were invited to come for an interview at a study office. The study office was located inside the offices of the Institute for Studies of Society, Economy, and Environment (iSEE), located in an office area in the center of Ha Noi. The initial wave of respondents ("seeds") were selected by the study investigators and given invitation letters. Subsequent waves of respondents were identified by previous respondents and given a referral coupon.

### 3.2.2 Eligibility:

**Inclusion criteria:**

Men who met all the criteria listed below were considered eligible for inclusion in the survey:

- Reported ever having sexual activities (involving ejaculation or penetration) with another men at least once in the last 12 months
- Were age 18 years or older at the time of the interview
- Agreed to take part in the survey.
- Presented a valid referral coupon from a previous survey participant (or a letter of invitation for seeds)

Fifty-four men who came to the study office were not enrolled because they did not give a credible report that they had ever had sex with a man (n=42) or they had not had sex with a man during the past 12 months (n=12).

### 3.2.3 Recruitment Process

Respondent Driven Sampling (RDS) was used in order to reach out to the various segments of the MSM population, which is both relatively sparse and largely hidden. The first wave of respondents (the “seeds”) was selected by the investigators through discussions with peer educators of outreach programs or key informants. Seeds were chosen for their knowledge of MSM networks and to reflect a diversity of age, education, profession, and income. However, it proved difficult to recruit MSM of lower educational levels. Initially, 30 seeds were enrolled to start the recruitment process. After two months, seven new seeds were enrolled to replace

the seven seeds that had not produced any participants. The next wave of survey participants was recruited by the seeds. Each interviewed participant, including the seeds, was told by the research staff about the process for recruiting new participants and was given three recruitment coupons for recruiting his peers into the survey. Each coupon had the address, office hours, and contact details of the study office and a unique code linking the recruiter with those recruited by him. In order to protect privacy, the coupon had no information that might imply that coupon bearers were MSM or were at elevated risk of HIV infection. Men given the coupon by a previous respondent could contact the study office to learn more about the study, make an appointment or come directly to the study office for the interview. The coupons were valid for one month from the date of the interview at which they were given to a respondent. The participant making the referral retained a portion of the coupons he distributed for use in collecting his recruitment incentive payment. Participants received a small incentive (VND 50,000, worth approximately USD 3 at that time) for their interview plus an additional VND 50,000 per participant whom they recruited.

In RDS, the referral chains are informative and used to adjust the results according to the size of the network of the person by whom a respondent was recruited. Information on referral is obtained through the use of ID numbers on the referral coupons given to respondents. We assigned ID numbers according to the system used for the IBBS in Viet Nam in 2005. The first part of the coupon ID number was the number assigned to the seed (01, 02, …, 30) given the first set of

coupons. Because this survey allowed respondents to refer a maximum of three peers, the second part of the coupon ID number was 1, 2, or 3. For instance, the three coupons given to seed number 03 had the ID numbers 03.1, 03.2, and 03.3. If the man given coupon 03.3 by seed number 03 came for an interview, at the end of the interview he was given coupons with ID numbers of 03.3.1, 03.3.2, and 03.3.3. This process proceeded according to the number of waves produced by each seed. The coupon ID numbers were recorded for use in the RDS adjustment.

### 3.2.4 Procedure at the study office

When a prospective participant presented to the study office and showed his referral coupon at the front desk, he was taken to a private interview room. A research staff member assessed his eligibility for the study and verified that he had not already been interviewed. The staff member then read a study information sheet to the potential participant. If the participant was eligible, he was asked to acknowledge that he understood what was involved in his participation in the study, and he agreed to participate, then a staff member instructed him in how to answer the questionnaire, which was presented through a computer that accessed an online questionnaire administered over the web. The staff member was available in the next room if the participant needed any help or had any question.

Participants who referred men to the study returned to the study office in order to collect the recruitment incentive payment. The returning participant was asked to present his halves of the coupons he had given out, and the ID numbers

were matched with those of men who had come for interview. Besides receiving his incentive payment, the returning participant was asked questions regarding his relationship with his recruitees and about refusals during his invitation process.

### 3.3. Survey recruitment and administration – Internet survey

#### 3.3.1 Study location

The national Internet survey was conducted from November 2008 to February 2009. Volunteers were recruited through publicity on gay websites and through email messages sent from these websites.

#### 3.3.2 Eligibility

**Inclusion criteria:**

Men were eligible for the survey if they gave affirmative answers to the following three questions at the beginning of the survey:

- Are you a man living in Viet Nam?
- Were you born before 15 October 1990?
- Have you had sex (oral, anal, or manual, involving ejaculation or penetration) with another man in the last 12 months?

#### 3.3.3 Recruitment process

The survey was conducted from 28 October 2008 to 31 January 2009 using Qualtrics.com, a commercial Internet survey platform with servers in the United States. To recruit respondents, banner advertisements with embedded URL links to

the questionnaire were posted on the five Vietnamese-language gay web forums identified by an Internet search and key informants and on an Internet "blog" targeting Vietnamese MSM. The smallest forum had over 22,000 registered users, the largest over 79,000. The banner advertisements were identical in appearance, to make clear to potential study respondents that the advertisements referred to the same study. The web forum administrators also posted a news release about the study and sent an email to their members inviting them to participate.

Four of the five forums that carried the advertisements for the survey were created and owned by individuals in the Vietnamese gay community. These four forums are registered as “dot com” (.com) or “dot net” (.net), making them less subject to censorship by the Viet Nam government than are "dot vn" (.vn) sites, which are officially registered with the government. Although one of the forums allows its members to publish personal profiles for dating purposes, none of these forums posts or allows its members to post sexually explicit photos or videos. The fifth forum was an online HIV prevention project for MSM in 5 major cities in Viet Nam. This forum, supported by Family Health International, has a “dot vn” (.vn) domain name. Membership in all of the forums is free of charge. One well-known blog for gay men was also used to advertise the survey.

The survey began with information about the study and about the Institute for Studies of Society, Economics, and Environment (iSEE), the institution conducting the survey, to assure website members about the study's credibility. The survey

instructions and the end of every page of the online questionnaire provided iSEE's contact information, in case respondents had questions or concerns regarding the survey (iSEE responded to several inquiries about the purpose of the survey and requests for counseling). In addition, a question and answer thread was created on each forum to allow study respondents and the research team to exchange comments regarding the survey. There were about 150 posts to these forums, across all of the websites.

In order to encourage the owners of the forums and their members to participate, a small incentive, worth 0.7 USD per completed questionnaire, was given to a charity selected by the forum's owner.

Visitors who clicked on the study banner on a participating web site were taken to the study information page. After reading the study description and consent information, they were asked to click the “Continue” button if they wanted to participate. The questionnaire began with the three eligibility criteria: 1) man living in Viet Nam; 2) age 18 years old or older; and 3) had sex with other male(s) in the last 12 months. The first "no" answer to any of these questions took the visitor to a “Thank you” page and concluded the survey.

While answering the questionnaire, the respondent could go backward to change answers to previous questions. However, if the browser session ended accidentally or intentionally, all answers were cleared from the session, so that in

case another person used the same computer to take the survey, the previous user's answers could not be read. That meant, however, that a respondent could not return to complete the questionnaire from where he left off if the browser was closed for any reason.

### 3.4 Survey questionnaire

The survey questionnaire covered the following topics:

- Sociodemographic characteristics
- Concealment of homosexuality
- Self-esteem
- Gender non-conformity
- Social support
- Sexual risk behavior including number and type of sex partners ("commercial", "regular" and "non-regular", male and female)
- Knowledge about HIV and AIDS
- Perception of HIV risk
- Exposure to HIV and AIDS prevention interventions
- Network structure and relationship and knowledge about his recruiter (this topic was included only in the RDS survey)

The questions on sociodemographic characteristics, sexual behaviors, exposure to HIV and AIDS prevention were modified from the Behavior Sentinel Surveillance questionnaire [39].

Questions on concealment of homosexuality, self-esteem, gender conformity, social support, and stigma and discrimination sections were modified from published studies.

Concealment of homosexuality / self-disclosure of sexual identity was assessed by asking the number of “people in your life who are important or were important to you and whom you told that you are (gay/bisexual)” [14].

Gender nonconformity was measured with the question "Do you consider yourself to be effeminate?", with response choices definitely yes (1), somewhat yes (2), somewhat no (3), and definitely no (4) [13].

Scales with 4-point Likert-type response choices were used to measure level of self-esteem (10 items), [40] social support (an 8-item version of the UCLA Loneliness Scale [41-43]), internalized homophobia (26 items) [43], and perceived stigma (10 items) [11,18].

Sexual behaviors, including condom use, were measured both for the past 6 months and for the most recent sexual encounter: number and gender of sexual partners, types of sexual partners, type of intercourse (oral, vaginal, anal) and condom use during the past 6 months. Type of sexual partners was categorized as

regular (in a relationship or living together), commercial (partners with whom one traded money or goods), or casual (non-regular, not paid or paying).

HIV knowledge was assessed with five questions used in the report of the United Nations General Assembly Special Session on HIV (UNGASS) [2].

The questionnaire was developed in English and then translated into Vietnamese. To ensure the quality of translation, an independent translator was hired to translate the questionnaire back to English. The research team compared the original and translated English versions, and revised the Vietnamese questionnaire before pretesting it with MSM with different educational backgrounds and local dialects. Explanations and slang terms were provided for words that might be unfamiliar. After testing, the questionnaire was piloted in Ha Noi and Ho Chi Minh City with different groups of MSM.

Both surveys used the same questionnaire and administered it over the Internet. However, the order of questions was slightly modified for the study that used Internet-based online recruitement.

The questionnaire took 30 minutes to 1 hour to complete, depending upon the Internet connection speed and individual computer skills.

### 3.5 Data management

#### 3.5.1 Collection of questionnaire responses

All questionnaire responses to both surveys were stored in Qualtrics' firewall-protected computer servers in the United States. Responses were written to the online database four hours after the questionnaire was started, even if it had not been completed. Data were downloaded from Qualtrics as comma separated value (CSV) UTF-8 format files and then imported into and managed with SAS version 9.2 [44]. Data from the RDS survey were then transferred from SAS format to text format (tab delimited) for analyses by RDSAT 6.0.

#### 3.5.2 Checking for duplicated submissions (Internet survey)

Internet-based surveys are susceptible to being completed multiple times by the same person. Submission of duplicate questionnaires is often controlled by accepting only one submission from an IP (Internet Protocol) address [31,45]. However, many Internet users in Viet Nam access the Internet from a café, a shared Internet connection, or someone else's computer, so this method of avoiding duplication was not used. Also, in Viet Nam the IP address is not a dependable identifier. Some Internet service providers provide dynamic rather than static IP addresses to their customers, so the same computer user may appear on the Internet from different IP addresses. Email addresses provided a unique identifier, but these were available for only 1112 respondents to the Internet survey. Therefore, identification of possible duplicated submissions was carried out as follows. A set of 22 variables, including all sociodemographic characteristics, were used to screen for possible duplicates.

Submissions with identical responses to all variables in this set were considered to be duplicates. Within each pair or triplet of apparently identical submissions, the earliest was retained unless it was not complete and a later one was. A total of 28 repeat submissions among 2668 submissions with completed sociodemographic characteristics were deleted.

### 3.5.3 Removal of potentially identifying information

Potentially identifying information consisted of the respondent's computer IP (Internet protocol) address, recorded automatically by Qualtrics, and the respondent's email address when he provided it to indicate a desire to receive information relevant for MSM. Both the IP and email addresses were deleted before data were analyzed.

## 3.6 Data Analyses

### 3.6.1 Analysis of the RDS survey

The data from the RDS survey were analyzed using the free RDSAT computer program which is available at http://www.respondentdrivensampling.org. Estimates population proportions and 90% confidence intervals (CI) were produced for interested variables.

Estimates population proportions were adjusted for referral chains and personal network sizes of participants [22]. In order to do that, recruiters and their recruitees were linked by the coupon ID numbers. Personal network size was

estimated based on the participant's answer to the question "How many MSM have you contacted (in person, by phone, or Internet) in the last month?". The option to "pull-in outliers of network size" was set at 1%, which means when a man's network size was outside of the specified bounds, his network size was set to the value of the nearest lower or upper bound percentage.

The formula to estimate population proportions[22] is:

$$P_a = \frac{S_{ba} N_b}{S_{ba} N_b + S_{ab} N_a}$$

where

$P_a$ = the estimated population proportion in category "a" of the behavioral outcome variable (e.g., consistent condom users)

$S_{ab}$ = the proportion of survey respondents in group "b" (i.e., inconsistent and non-users) selected for recruitment by respondents in group "a" (consistent users)

$N_a$ = the mean network size of survey respondents in group "a"

Note: $P_b$, $S_{ba}$, and $N_b$ are defined similarly for respondents in group "b"

RDSAT obtains confidence intervals for estimates of population proportions by using a three-step bootstrap procedure [24]. First, a set of sub-samples is generated from the original sample. Second, a set of replicate estimates is calculated for this set of sub-samples. Third, a confidence interval is constructed by examining the variability in these replicate estimates.

In the first step, the “sub-samples” consist of randomly chosen referral chains. For a given seed, the program randomly chooses one of his recruits. For the selected recruit, the program randomly chooses one of his recruits. This process continues until the end of the recruitment chain is reached. The estimate is then computed from this sub-sample using the RDS method, and the process is repeated 2,500 times (the default setting). The $5^{th}$ and $95^{th}$ percentiles of the distribution of replicate estimates define, respectively, the lower and upper limits of the 90% confidence interval [24].

### 3.7.2 Analysis of the Internet-based survey

The data from the Internet-based survey were analyzed with SAS 9.2. Frequencies, proportions, means and medians were inspected for all study variables. Cross tabulations were used for consistency checks. Sociodemographic characteristics of respondents who completed the sociodemographic section were compared to those of respondents who also completed the sexual behavior section and of respondents who completed the whole questionnaire.

The primary outcome variable used to examine associations with other study variables was unprotected anal intercourse, which for this study was defined as whether or not a condom was used at last anal sex within the past 6 months. This variable was constructed and coded as a binary variable with 1 = Yes, 0 = No, and not applicable for men not reporting anal intercourse in the past 6 months.

Relationships between the primary outcome and the following covariates were examined:

- Sociodemographic characteristics: age, education, income. All were coded as categorical variables.
- Concealment of homosexuality: Coded as a categorical variable
- Sexual identities: Coded as a categorical variable
- Types of sex partners Coded as a categorical variable
- Knowledge about HIV: coded as a binary variable with 1 if all answers to five questions on HIV prevention and transmission were correct, and 0 if any answer to those questions was incorrect.
- Perception of HIV risk: coded as a categorical variable with 0 = No, 1 = Yes, and 2 = Do not know.
- Exposure to HIV and AIDS prevention interventions: coded as categorical variables

The strategy for examining these association was as follows:

Univariable analyses (one independent and one dependent variable) were carried out to examine the associations of different factors with outcomes (sexual risk behaviors). Variables (risk factors) found significant in the univariable analyses were then analyzed in the multivariable analysis.

Multivariable analysis used sexual risk behavior variables as the dependent variable. Independent variables (sociodemographic characteristics, self-esteem, and

social support, found sexual partners on the Internet, …) significantly associated with the outcomes in the univariable analyses were included in this model.

Prevalence ratios and their 95% confidence intervals were calculated using log binomial regression [46].

# CHAPTER IV: SEXUAL RISK BEHAVIORS AMONG MEN WHO HAVE SEX WITH MEN IN HA NOI, VIET NAM


## Abstract

We used respondent driven sampling (RDS) to examine sociodemographic characteristics, sexual identities, and key indicators of HIV risk among men who have sex with men (MSM) in Ha Noi, Viet Nam. 402 MSM who had sex with a man during the past year completed a self-administered questionnaire. Based on the RDS-adjusted results, most (75.9%) of the target population were younger than 25 years old and the majority (60.3%) had attended university. 56.2% self-identified as gay, 15.2% as bisexual, and 11.6% as "straight". 58% reported having had sex with casual male partners in the past 6 months. About one in four men had paid another man for sex, and about one in five had ever been paid for sex with a man. 54.2% did not use condoms consistently when having anal sex with casual male partners. Similar percentages did not use condoms consistently when they bought or sold anal sex. Only about one-third gave correct answers to all 5 questions on HIV transmission and prevention. Only 31% of the men considered themselves at risk of HIV infection. HIV prevention interventions for Vietnamese MSM are urgently needed. Also needed are ways to reach older, less-educated MSM.

## Introduction

In many parts of the world, men who have sex with men (MSM, which as used here refers to all men, regardless of sexual self-identity, who have had sex with another man) are a key population at elevated risk of HIV infection. Worldwide, MSM make up 5% - 10% of all HIV infections [47]. Research on MSM can be challenging, however, especially in societies where same-sex sexual behavior is highly stigmatized [28]. Although MSM behavior is not illegal in Viet Nam, talking about MSM is still a taboo. In addition, many MSM deprecate themselves and think of their sexuality as a sickness or bad fate. Male-to-male sex is definitely not considered to be normal or acceptable, and the majority of Vietnamese MSM keep their sexual orientation secret and marry women or intend to marry [5].

Studies of MSM are also hampered by the sparseness of the MSM population, which has led researchers to use sampling strategies other than surveying the general population. The most common approaches are venue-based sampling, where men are recruited from locations frequented by MSM, and referral sampling, such as the snowball technique. For example, one of the first studies of MSM in Viet Nam recruited 219 informants from a variety of venues where MSM meet, including bars, cafes (40%), discos, parks (25%), saunas (1%), swimming pools (5%), brothels (4%), cinema (1%), and barbershops. The study also recruited participants (20%) using the snowball technique and from other referrals [7]. Another

study in Ho Chi Minh City in 2007 recruited 600 MSM in 72 venues including parks, bars, and swimming pools [8].

A major problem with venue-based and referral methods is that the samples they yield may not be representative of the MSM population [28]. In the past several decades, researchers seeking to obtain probability samples from "hard-to-reach populations" have turned to a new sampling technique, respondent driven sampling (RDS) [21-25]. RDS is a method of referral sampling which involves identifying a set of persons ("seeds") from the target population and offering them an incentive to refer people in their community/social networks to the survey. Each survey respondent is then offered an incentive for referring additional participants. Similar to snowball recruitment, this continuous community/network recruitment creates sampling chains in populations that would have been difficult to reach using traditional sampling efforts.

The advantage of RDS versus conventional chain-referral methods is that RDS allows for the assessment of inclusion probabilities for members of the population based on a mathematical model of the recruitment process [21]. Also, participants are limited in the number of other participants they recruit, so the sample will not be dominated by participants with large networks [21]. Studies have shown that compared to conventional sampling methods, RDS enables quicker, cheaper, and easier access to hidden populations [26,28]. RDS has been used to recruit MSM in several countries [26,27], including Viet Nam [10].

The HIV/STI Integrated Biological and Behavioral Surveillance (IBBS) in Vietnam in 2005-2006 attempted to recruit its sample through respondent driven sampling, but most participants came from among MSM visiting intervention centers [9]. Similar to earlier studies, the IBBS reported that MSM in Viet Nam have poor knowledge about HIV transmission and prevention and that MSM practice behaviors putting them at high risk of HIV infection. The IBBS found that only 45% of MSM in Ha Noi and an even smaller percentage (19%) of MSM in Ho Chi Minh City have a correct understanding about HIV prevention methods. Large percentages of MSM had multiple sexual partners (43% in Ha Noi and 70% in Ho Chi Minh City) and/or exchanged sex for money (almost 22% in Ha Noi and 35% in Ho Chi Minh City). Among MSM in Ha Noi who had paid sex with another man during the previous month, only 4.3% regularly used a condom during these encounters. HIV prevalence in MSM was found to be 9.4% in Ha Noi and 5.3% in Ho Chi Minh City [9].

If researchers recruit MSM who are in some way more visible than others, certain groups of MSM are likely to be overrepresented. The IBBS reported that 33.9% of MSM in Ho Chi Minh City self-identified as "straight". The study by Nguyen et al. [8] reported that 76.6% of their sample in Ho Chi Minh City were bisexual but a previous study in Ho Chi Minh City [7] reported that its sample was 31% bisexual. The study in Khanh Hoa reported approximately 50% bisexuals. In addition, the Vietnamese studies found very large percentages of Vietnamese MSM who reported sex trading: 50% of MSM in the Colby (2003) study, more than one third of MSM in the Nguyen (2007) study, and almost 22% (Ha Noi) and 35% (Ho Chi Minh City) in

the IBBS [9]. Another concern with these studies is the possibility that condom use or accessibility of HIV interventions might have been over reported due to social desirability influences [9].

We conducted a study using RDS and a self-administered questionnaire to obtain a broader and more representative picture of sociodemographic characteristics and sexual behaviors among MSM in Ha Noi (3.4 million at the time of the survey, [48]), the capital city of Viet Nam. It is estimated that there were about 19,000 people living with HIV in Ha Noi at the end of 2008 [4]. In recent years the Ha Noi MSM population has been more visible, but little is known about its sociodemographic characteristics or risk behaviors.

**Methods**

Eligibility criteria for the study were : 1) Vietnamese male living in Ha Noi at the time of the study; 2) at least18 years old; 3) had sex (oral, anal, or mutual masturbation) with other male(s) in the last 12 months. Prospective participants needed an invitation letter (for seeds) or a valid referral coupon from the study.

Investigators selected the seeds through discussions with peer educators of outreach programs and key informants, taking into consideration age, education, profession, and knowledge about MSM networks. Initially, 30 seeds were enrolled to start the recruitment process. After two months, seven new seeds were enrolled to replace the seven seeds that had not produced any participants.

The first wave of participants for the survey were recruited by the seeds. Each interviewed participant, including seeds, was told by the research staff about the process for recruiting new participants and was given three coupons for recruiting his peers into the survey. Each coupon had the address, office hours, and contact details of the study office and a unique code identifying the recruiter so that he could be linked with men he recruited. In order to protect privacy, the coupon had no information that might imply that coupon carriers were MSM or were at higher risk of HIV infection. Men given the coupon by a previous respondent could contact the study office to learn more about the study or to make an appointment. They could also come directly to the study office for interview. The coupons were valid for one month from the date of the interview at which they were given to a respondent. Participants received a small incentive (VND 50,000, worth approximately USD 3 at that time) for their interview plus an additional VND 50,000 per participant whom they recruited.

Interviews were conducted in a study office located in an easily accessible office area in the center of Ha Noi and open 9:00 AM to 9:00 PM, seven days/week. The office was not visibly identified with activities related to HIV or MSM. The principal investigator, study manager and two research assistants, all of whom completed online ethical training (CITI), were responsible for the survey.

When a prospective participant presented to the study center and showed his referral coupon at the front desk, he was taken to a private interview room. The

coupon number was logged into a coupon management database. A research staff member assessed his eligibility for the study and verified that he had not already been interviewed. The staff member then read a study information sheet to the potential participant. If the eligible participant acknowledged full understanding of his participation in the study and agreed to participate, the staff member instructed him in how to answer the online questionnaire located on a private web site. The staff member was available in the next room if the participant needed any help or had any questions.

The questionnaire was developed in English and then translated into Vietnamese. To ensure the quality of translation, an independent translator was hired to translate the questionnaire back to English. The research team compared the original and translated English versions, and revised the Vietnamese questionnaire before pretesting it with MSM with various education backgrounds and local dialects (10 pre-testers in Ho Chi Minh City and 10 in Ha Noi). Explanations and slang terms were provided for words that might be unfamiliar. After pretesting, the Vietnamese questionnaire was piloted in Ha Noi with different groups of MSM and then implemented in a commercial web-based survey platform (Qualtrics.com). The online questionnaire was piloted with 10 MSM before the actual survey began. The final online questionnaire took 30-60 minutes to complete, depending upon the behaviors the participant reported and his level of computer skills.

The study questionnaire covered the following topics: sociodemographic characteristics, sexual identity, concealment of homosexuality, self-esteem, gender non-conformity, social support, sexual risk behavior including partner seeking practices, number and type of sex partners (“regular”, “casual”, “paying”, “paid”), condom use, knowledge about HIV and AIDS, perception of HIV risk, and access to HIV/AIDS prevention interventions. Additional information about the questionnaire items is available (Nguyen *et al*., submitted).

Questionnaire responses were stored in Qualtrics' firewall-protected computer servers in the United States. When the survey ended, data were downloaded as an SPSS UTF-8 format file, imported into SAS 9.2 for data management [44], combined with the coupon management database, and then read with *RDSAT 6.0*, a free software package for analyzing data from RDS surveys (www.respondentdrivensampling.org). Results are presented with and without adjustment for the respondent-driven sampling. Since, in principle, the estimates adjusted for RDS apply to the population being sampled, we use the term "participants" to refer to numbers and proportions among the actual survey participants and the term "target population" for estimates and 90% confidence intervals referring to MSM represented by the participants and their social networks. *RDSAT* was also used to calculate homophily scores, which range from -1.0 (perfect heterophily) to 1.0 (perfect homophily).

The study proposal was approved by the University of North Carolina at

Chapel Hill Public Health-Nursing Institutional Review Board (IRB study number 08 – 0073) and conducted under auspices of permission A-650 of the Viet Nam Ministry of Science and Technology.

**Results**

From 8 June 2008 to 8 October 2008, study staff gave out 998 coupons, and 468 men (including the seeds) came to the study office. A total of 54 men were judged not eligible because they reported not having ever had sex with a man or their answers to questions about MSM implied they had not (42 men) or they reported not having had sex with a man in the last 12 months (12 men). Of the remaining 414 men, judged eligible, 402 (97%) completed the online questionnaire.

The seeds were responsible for from 1 to 12 waves of participants (Table 1). The *RDSAT* program estimated the number of waves required to achieve equilibrium (the point from which additional waves do not modify the point estimate) as 7 waves for age distribution, 4 for education distribution, and 4 for sexual identity.

There was relatively little relation between participants' sexual identity and that of the men they referred to the study. *RDSAT*-calculated homophily scores for sexual identities ranged from -0.26 to 0.11 for all self-identifications other than transsexual and "other", both of which groups were completely heterophilous (score -1.0). Homophily scores for the other MSM identities were: gay (0.11, n=249 men), bisexual (-0.26, n=68), "open" (0.06, n=14), "questioning" (-0.05, n=19), and "straight" (0.01, n=36).

**Sociodemographic characteristics.**

Most MSM in the study (64.9% of participants, 75.9% of the target population) were younger than 25 years (Table 2). The youngest target population group (age 18-19 years) was underrepresented among the actual participants. By contrast, MSM with university education were overrepresented (68.3% of participants, 60.3% of the target population). Participants also reported higher incomes than estimated for the target population. Sex workers were barely represented in the survey, and very few MSM were married. Consistent with their youth, nearly half of MSM (44.8% of the target population) lived with parents or siblings. About one in four MSM lived alone, and about one in six lived with a male partner, very few lived with a spouse or female partner, and very few reported no fixed place of residence.

**Sexual identity**

The majority (62.1% of participants, 56.2% of the target population) self-identified as gay, followed by 15.2% of the target population who self-identified as bisexual. The third largest category (11.6% of the target population) characterized themselves as "straight". A plurality (37.2%) of the target population were sexually attracted only to men, and this segment was even more prominent (48.0%) among participants. The next largest category (34.5% of the target population) were more attracted to men than to women. A small percentage (6.1% of the target population) indicated being attracted only to women as sexual partners. A minority of participants (40.9%) and of the target population (34.2%) considered themselves to be effeminate. The majority of participants (57.8%) and an even greater percentage

of the target population (72.5%) said they were "in the closet" most or all of the time. However, the majority (64.2% of participants, 52.8% of the target population) had disclosed their MSM activity to someone whom they considered important to them.

**Network and partner-seeking**

Almost all MSM (98%) had contact in the last month with other MSM they knew, but most (81.6%) had contact with only one (Table 3). Nearly all MSM in Ha Noi reported using the Internet (93.9%) but only a minority had sought male sex partners on the Internet (34.9%). Over half of MSM in Ha Noi ever visited venues for MSM, and such venues were slightly more popular as a way to find male sexual partners (35.3%). Only slightly less popular as a way of finding male sex partners was through friends (28.9%).

**Sexual behaviors in the last six months:**

Ninety percent of the target population had sex with other men in the last six months, including 70.6% who had sex with men only and 19% who had sex with both men and women (Table 4). Sixty percent of the target population had more than one male partner during that time. Over half of the target population (58%) had sex with casual male partners. About one in four men had paid another man for sex in the past 6 months, and about one in five had ever been paid for sex with a man. About half of the target population (54.2%) did not use condoms consistently when having anal sex with casual male partners. Similar percentages of the target population did not use condoms consistently when they bought or sold sell anal sex.

**HIV knowledge, perception and access to prevention**

Most of the target population knew that using a condom can prevent HIV transmission (Table 5). However, only one-third gave correct answers to all 5 questions on HIV transmission and prevention.

Less than one third (31%) of the target population considered themselves at risk of HIV infection. Almost half of the target population (46.4%) had ever obtained an HIV test and the result. In the last year, one-third (33%) of the target population had obtained a free condom, but only one in five had participated in other HIV prevention activities. However, almost half of target population (45.5%) reported having received safer sex and safer drug use information in the last 12 months. The Internet was the most common source of such information (64.7%), followed by television (54.5%), and radio (49.2%). About one in four members of target population got prevention information from health care workers (24.5%) and from peer educators (26%).

**Discussion**

We conducted an RDS survey of MSM in Ha Noi during a 16-week period. Over 400 MSM came to the study office and successfully self-administered a web-based questionnaire after minimum instruction by researchers. The number of recruitment waves exceeded the required number to reach equilibrium for estimates of principal sociodemographic and sexual identity characteristics. As indicated by the RDS adjustment, recruited participants were older and had higher incomes than

were estimated for the target population. The estimated age and education distributions of Ha Noi MSM were similar to those reported by the IBBS [9]. The fact that both studies recruited men who were more highly educated and affluent than Ha Noi men in general suggests that the networks through which MSM were recruited for our study are segregated by age and education. On the other hand, the low homophily by sexual identity as gay, bisexual, or heterosexual indicates that participants' social networks were not segregated by sexual identity. Although the transsexual group was completely heterophilous, that finding may reflect the relative scarcity of transsexuals.

The findings from our study are for the most part similar to those from the IBBS [9]. For example, as in the IBBS, only a small proportion of the target population in our study considered themselves at risk of HIV infection. Consistent with that belief, nearly half of the target population have never been tested for HIV. Similarly, our study and the IBBS are consistent in observing a high prevalence of sexual behaviors, including having multiple partners and having unprotected anal sex, that put MSM in Ha Noi at risk of transmitting and acquiring HIV. A considerable proportion of these men also have sex with female partners. As in other conservative societies, many MSM might have sex with women to hide their sexual identity. In addition, heterosexual men may have sex with men for money. Since MSM have a higher HIV seroprevalence than the general population, MSM who also have sex with women are a bridge population that may facilitate HIV transmission from MSM to the general population.

A marked difference between our results and those of the IBBS is that 10% of MSM in the IBBS made their living by selling sex, compared to only 0.3% of the MSM we studied. However, 17% of MSM in our study reported having sold sex in the last 6 months, which is not greatly different from the IBBS observation of 21% of MSM who reported having sold sex in the last month.

The proportions of the target population who accessed prevention services such as voluntary HIV testing and free condom distribution or attended "edutainment" activities were also low. There have been a number of HIV prevention intervention programs in Ha Noi, but only one or two of them have been specifically designed for MSM. Our results suggest that HIV prevention interventions for MSM were not widely known among the target population or that there were barriers to accessing them. Therefore, HIV prevention services in Ha Noi need to be improved to attract more members of this high risk population.

Some members of the target population started having sex with other men before age 16 years, and a large proportion had sex before the age of 18. Thus, current HIV and sexual health education for young teenagers should include information on MSM and risk of HIV infection.

Internet use is widespread in this highly educated, relatively affluent, largely urban population and has emerged as one of the most common places for MSM to find their partners. The Internet was also reported as the most common source of prevention information. Given its growing availability, convenience, and potential for

private communication, the internet has great potential as a channel for HIV prevention. Other mass media, such as television, radio, and newspapers, also have good coverage and should be used for HIV prevention messages. Access to health care workers and peer educators should also be improved, however, to provide such services as counseling and care. One way to increase access might be to investigate providing some services, such as counseling, over the Internet.

Limitations of our study and others which assess reported behaviors include the possibilities of recall failure, recall bias, non-disclosure, and social desirability influences. Computer-based self-interviewing has been associated with increased disclosure of sensitive behaviors [49], including in Viet Nam [50].

A limitation of RDS is the lack of a reliable method to evaluate the true refusal proportion of potential respondents. Also, we observed that some respondents received coupons from multiple recruiters. We do not know how many potential respondents might have received more than one invitation coupon and what that might imply for the RDS adjustment. Also, even though we screened potential respondents to verify eligibility and detected a number of men who had pretended that they had sex with other men in order to receive the small monetary incentive, there may have been other ineligible men who passed the screening process.

RDS adjustment requires knowing the size of the personal network of each respondent [21]. However, network size has been measured in different ways in

different studies. In our study, we revised the question used by the IBBS by adding other types of personal contacts, such as through mobile phone and online chatting. But there is also the concern that the number of individuals whom someone contacted in the previous month may not accurately measure personal network size, if a man has too many contacts to remember or the previous month was unrepresentative for some reason. Further work on these issues will be important to build confidence in the use of the RDS method.

In conclusion, we conducted an RDS survey of MSM in Ha Noi, Viet Nam. In our mostly young, well-educated population, the great majority were single and lived alone or with parents. Majorities identified as gay, preferred men as sexual partners, considered themselves not effeminate, and had disclosed their sexual identity to someone, although the majority were mostly "in the closet" most of the time. Nearly all MSM who had sex with a man in the past year were sexually active in the past six months, often with multiple partners of various types, and often had unprotected anal sex. Most also had one or more mistaken beliefs about HIV and saw themselves as not at risk of becoming infected. The need for expanded HIV prevention education and other interventions is clear, and the Internet may be a strategic channel to employ.

**Table 1: Characteristics of "seeds"[a] and the number of recruited participants in 2008 RDS survey of MSM in Ha Noi.**

| ID | Age | Education | Income (USD) | Sexual Identity | Personal network size | Number of waves | Total participants recruited by seeds |
|---|---|---|---|---|---|---|---|
| 2 | 20 | Undergraduate | <30 | Gay | 10 | 5 | 9 |
| 3 | 20 | Undergraduate | <30 | Gay | 5 | 1 | 3 |
| 4 | 25 | Undergraduate | 90 - 120 | Bisexual | 30 | 3 | 22 |
| 5 | 41 | High school | 90 - 120 | Gay | 30 | 5 | 54 |
| 6 | 32 | Undergraduate | 90 - 120 | Gay | 30 | 3 | 4 |
| 7 | 19 | Undergraduate | 60 - 90 | Gay | 10 | 1 | 1 |
| 8 | 21 | Undergraduate | <30 | Gay | 10 | 4 | 17 |
| 9 | 49 | Middle School[b] | 30 - 60 | Gay | 60 | 4 | 6 |
| 113[c] | 28 | Undergraduate | 90 - 120 | Bisexual | 10 | 1 | 2 |
| 12 | 20 | Undergraduate | 60 - 90 | Gay | 50 | 1 | 3 |
| 14 | 32 | Undergraduate | 90 - 120 | Gay | 17 | 1 | 1 |
| 15 | 19 | Undergraduate | 30 - 60 | Gay | 80 | 3 | 5 |
| 16 | 20 | Undergraduate | . | Gay | 10 | 1 | 2 |
| 17 | 29 | Undergraduate | 90 - 120 | Gay | 10 | 5 | 19 |
| 19 | 19 | High school | 30 - 60 | Questioning | 20 | 5 | 19 |
| 20 | 23 | Undergraduate | 120 - 150 | Bisexual | 60 | 1 | 3 |
| 21 | 28 | Undergraduate | 150 - 180 | Gay | 28 | 7 | 18 |
| 22 | 20 | Undergraduate | 90 - 120 | Gay | 15 | 7 | 54 |
| 23 | 34 | Postgraduate | 150 - 180 | Gay | 100 | 2 | 2 |
| 26 | 26 | Undergraduate | 90 - 120 | Gay | 15 | 12 | 51 |
| 27 | 29 | Undergraduate | 120 - 150 | Gay | 20 | 1 | 1 |
| 28 | 27 | Undergraduate | 120 - 150 | Gay | 16 | 8 | 24 |
| 29 | 32 | Postgraduate | 120 - 150 | Gay | 50 | 5 | 12 |
| 31 | 27 | Undergraduate | 120 - 150 | Gay | 3 | 3 | 7 |
| 33 | 34 | Undergraduate | 150 - 180 | Gay | 5 | 2 | 8 |
| 35 | 30 | Undergraduate | 120 - 150 | Gay | 20 | 1 | 2 |
| 36 | 32 | Postgraduate | 60 - 90 | Gay | 2 | 3 | 6 |
| 37 | 27 | Undergraduate | 120 - 150 | Gay | 50 | 1 | 2 |
| 38 | 22 | Undergraduate | 90 - 120 | Questioning | 10 | 1 | 2 |
| 39 | 34 | Undergraduate | 150 - 180 | Bisexual | 5 | 3 | 3 |

[a] Seeds, selected by the research team, were the first wave of respondents.

[b] Grades 6-8.

[c] The data record for seed 11 was lost from the computer, so one of his recruits was "promoted".

**Table 2: Sociodemographic characteristics and sexual identities of MSM in Ha Noi, 2008.**

| | Crude[a] | | RDS adjusted[b] | |
|---|---|---|---|---|
| | N | % | % | 90%CI[c] |
| **Age group** | | | | |
| 18-19 | 84 | 21.2 | 37.0 | 29.1 - 47.6 |
| 20-24 | 173 | 43.7 | 38.9 | 29.7 - 44.2 |
| 25-29 | 90 | 22.7 | 17.1 | 11.7 - 23.8 |
| >=30 | 49 | 12.4 | 6.9 | 3.6 - 11.5 |
| **Education level** | | | | |
| Not finished high school | 26 | 6.5 | 8.6 | 4.9 - 13.4 |
| Finished high school | 101 | 25.3 | 31.1 | 24.9 - 38.2 |
| Post-secondary education | 273 | 68.3 | 60.3 | 51.5 - 67.4 |
| **Income per month (USD[d] )** | | | | |
| <30 | 60 | 15.3 | 24.9 | 17.9 - 33.6 |
| 30 - <60 | 62 | 15.8 | 19.8 | 14.3 - 25.5 |
| 60 - <120 | 115 | 29.3 | 29.1 | 22.8 - 35.4 |
| 120 - < 300 | 95 | 24.2 | 16.6 | 10.9 - 20.7 |
| > 300 | 60 | 15.3 | 9.5 | 5.3 - 15.5 |
| **Main sources of income[e]** | | | | |
| Farmer | 2 | 0.5 | 0.2 | 0.1 - 0.7 |
| Government Officer | 28 | 6.7 | 7.8 | 4.7 - 12.2 |
| Staff of entertainment venue | 37 | 8.9 | 6.3 | 3.9 - 9.1 |
| Office Worker/Sale | 66 | 15.9 | 11.2 | 7.7 - 15.4 |
| Business | 55 | 13.2 | 11.4 | 7.5 - 16 |
| Student | 113 | 27.2 | 25.9 | 19.4 - 31.1 |
| Self-employed | 111 | 26.7 | 29.3 | 23.6 - 36 |
| Sex worker | 4 | 1.0 | 0.3 | 0.1 - 0.9 |
| Unemployed | 21 | 5.1 | 8.8 | 5.1 - 13.8 |
| Other | 38 | 9.1 | 8.8 | 5.4 - 13.2 |
| **Marital status** | | | | |
| Single (Never married) | 360 | 89.8 | 90.0 | 86.3 - 93.6 |
| Married | 7 | 1.8 | 2.6 | 0.6 - 5.1 |
| Divorced/ Separated/ Widow | 10 | 2.5 | 2.4 | 0.6 - 3.8 |
| Other | 24 | 6.0 | 5.1 | 2.8 - 8.3 |
| **Currently live with whom** | | | | |
| Alone | 102 | 25.4 | 26.4 | 20.7 - 33.2 |
| Male partners | 69 | 17.2 | 11.7 | 8.1 - 16.1 |
| Friends | 42 | 10.5 | 11.1 | 6.3 - 16 |
| Wife/female partners | 5 | 1.3 | 2.9 | 0.7 - 5.9 |
| Parents/siblings | 170 | 42.4 | 44.8 | 36.7 - 52.3 |
| No fixed place | 13 | 3.2 | 3.1 | 1.1 - 5.3 |

| | | | | |
|---|---|---|---|---|
| **Sexual Identity** | | | | |
| Gay | 249 | 62.1 | 56.2 | 48.4 - 62.3 |
| Bi-sexual | 68 | 17.0 | 15.2 | 10.6 - 21 |
| Transsexual | 7 | 1.8 | 1.5 | 0.3 - 3 |
| Open Minded | 14 | 3.5 | 5.1 | 2.1 - 8.7 |
| Questioning | 19 | 4.7 | 8.1 | 3.8 - 12.4 |
| Straight | 36 | 9.0 | 11.6 | 7.7 - 17.7 |
| Other | 8 | 2.0 | 2.3 | 0.5 - 4.6 |
| **Sexual Preference** | | | | |
| Attracted only to men | 192 | 48.0 | 37.2 | 28.6 - 42.5 |
| Attracted more to men than to women | 129 | 32.3 | 34.5 | 28.1 - 42 |
| Attracted to both men and women equally | 48 | 12.0 | 13.7 | 9.4 - 19.4 |
| Attracted to women more than to men | 19 | 4.8 | 8.5 | 4.7 - 14.1 |
| Attracted only to women | 12 | 3.0 | 6.1 | 2.7 - 10.4 |
| **Consider yourself to be effeminate** | | | | |
| Not effeminate | 236 | 59.1 | 65.8 | 58.8 - 72.7 |
| Effeminate | 163 | 40.9 | 34.2 | 27.3 - 41.2 |
| **Consider yourself to be discrete** | | | | |
| Definitely in the closet | 104 | 26.0 | 36.2 | 29 - 41.9 |
| In the closet most of the time | 127 | 31.8 | 36.3 | 31.3 - 43.8 |
| Half in and half out | 113 | 28.3 | 21.9 | 16.7 - 27.7 |
| Out of the closet most of the time | 35 | 8.8 | 2.6 | 1.5 - 3.6 |
| Completely out of the closet | 21 | 5.3 | 3.1 | 1.5 - 3.9 |
| **Disclosed sexual identity** | | | | |
| Yes | 256 | 64.2 | 52.8 | 44.9 - 59.2 |
| Never | 143 | 35.8 | 47.2 | 40.9 - 55.1 |

[a] Crude percentages apply to study participants
[b] Adjusted percentages apply to study participants and MSM in their sexual networks
[c] 90% confidence interval
[d] Based on the typical exchange rate in fall 2008
[e] Respondents may report more than one source.

**Table 3: Network and ways to find partner modes of MSM in Ha Noi, 2008.**

| | Crude[a] | | RDS adjusted[b] | |
|---|---|---|---|---|
| | N | % | % | 90% CI[c] |
| **The number of MSM that you knew and contacted in the last month** | | | | |
| 0 | 7 | 1.8 | 1.7 | 0.6 – 3 |
| 1 | 154 | 38.8 | 81.6 | 77.7 - 85.2 |
| 2-5 | 94 | 23.7 | 10.7 | 8.1 - 13.6 |
| 6-10 | 142 | 35.8 | 6.0 | 4.5 - 7.4 |
| **Ever visited venues for MSM (Bar, café, sauna..)** | | | | |
| Yes | 312 | 75.0 | 55.9 | 48.8 - 63.8 |
| No | 64 | 15.4 | 32.6 | 25.5 - 38.9 |
| Don't know | 24 | 5.8 | 11.5 | 7.4 - 16.4 |
| **Frequency of internet use** | | | | |
| Everyday | 272 | 68.0 | 61.3 | 55.3 - 69.4 |
| At least once a week | 75 | 18.8 | 22.2 | 15.5 - 26.7 |
| At least one a month | 31 | 7.8 | 10.4 | 6.7 - 14.7 |
| Don't use | 22 | 5.5 | 6.1 | 3.1 - 10.1 |
| **Places have looked for male sex partners in the last 12 months** | | | | |
| At my school/ university/ workplace | 31 | 7.5 | 5.9 | 3.2 - 8.7 |
| In the street or park | 70 | 16.8 | 10.6 | 7.5 - 14.8 |
| In the bar or disco | 104 | 25.0 | 14.6 | 10.6 - 18.7 |
| In the cinema | 11 | 2.6 | 1.3 | 0.4 - 2.5 |
| In the swimming pool | 35 | 8.4 | 5.1 | 2.1 - 6.5 |
| Through an intermediary/pimp | 25 | 6.0 | 2.6 | 1.3 - 4.1 |
| In a sauna/massage | 54 | 13.0 | 7.1 | 4.1 - 10.4 |
| In a coffee shop | 54 | 13.0 | 9.5 | 5.5 - 13.2 |
| Through friends | 158 | 38.0 | 28.9 | 25.2 - 36.3 |
| On the internet | 181 | 43.5 | 34.8 | 28.3 - 41.2 |
| Other | 11 | 2.6 | 2.8 | 0.8 - 5.2 |
| **The places where most often went to find male sex partners** | | | | |
| Through acquaintance | 84 | 26.8 | 27.1 | 19.5 - 34.6 |
| Cruising places (Bar, Café, sauna, park …) | 102 | 32.6 | 35.3 | 27.1 - 43.7 |
| Online | 117 | 37.4 | 34.9 | 25.1 - 45 |
| Other | 10 | 3.2 | 2.7 | 1 - 6 |
| **The places where you met your first sex partners** | | | | |
| Through acquaintance | 136 | 36.6 | 40 | 32.7 - 47.6 |

| | | | | |
|---|---|---|---|---|
| Cruising places (Bar, Café, sauna, park …) | 106 | 28.5 | 34.4 | 26.9 - 41.4 |
| Online | 105 | 28.2 | 21.6 | 16.5 - 30 |
| Other | 25 | 6.7 | 4.1 | 1 - 5 |
| **The places where you met your last sex partner in the last 6 months** | | | | |
| Through acquaintances | 110 | 37.0 | 33.2 | 24.2 - 40.6 |
| Cruising places (Bar, Café, sauna, park …) | 89 | 30.0 | 29.7 | 21.6 - 39.6 |
| Online | 98 | 33.0 | 30.4 | 23.6 - 42.1 |
| Other | 22 | 5.3 | 6.7 | 1.8 - 8.8 |

[a] Crude percentages apply to study participants.
[b] Adjusted percentages apply to study participants and MSM in their sexual networks.
[c] 90% confidence interval

**Table 4: Sexual behaviors of MSM in Ha Noi, 2008.**

| | Crude[a] | | Adjusted[b] | |
|---|---|---|---|---|
| | N | % | % | 90% CI[c] |
| **Age at first sex** | | | | |
| <16 | 36 | 9.7 | 5.6 | 2.6 – 7.3 |
| 16-17 | 109 | 29.3 | 32.2 | 24.9 - 40.5 |
| 18-20 | 154 | 41.4 | 40.3 | 32 – 46.7 |
| >20 | 73 | 19.6 | 21.9 | 17.2 - 30 |
| **Sexual partners in the last 6 months** | | | | |
| Had sex with both male and female partners | 63 | 17.5 | 19.0 | 13.3 - 24.1 |
| Had sex with male partners only | 264 | 73.3 | 70.6 | 64.1 - 77.1 |
| Had sex with female partner only | 20 | 5.6 | 7.4 | 3.3 – 12.4 |
| Did not have sex in the last 6 months | 13 | 3.6 | 3.0 | 1.5 – 5.4 |
| **No of male sexual partners in the last 6 months** | | | | |
| 0 | 18 | 5.3 | 4.1 | 2.3 – 7.7 |
| 1 | 87 | 25.4 | 36.3 | 26.9 - 43.4 |
| 2-5 | 146 | 42.6 | 46 | 38.3 - 53.8 |
| 6-10 | 39 | 11.4 | 6.0 | 3.6 – 11.2 |
| >10 | 53 | 15.5 | 7.7 | 4 - 11.1 |
| **Engaged in oral sex with other men in the last 6 months** | | | | |
| Yes | 305 | 92.7 | 90.0 | 86.2 - 96.3 |
| No | 24 | 7.3 | 10.0 | 3.7 - 13.8 |
| **Had anal sex with other men in the last 6 months** | | | | |
| Yes | 263 | 85.1 | 85.3 | 76.8 - 89.3 |
| No | 46 | 14.9 | 14.7 | |
| **Types of male partners in the last 6 months (n=327)** | | | | |
| Regular partners | 262 | 79.9 | 77.5 | 72 - 84.3 |
| Casual Partners | 208 | 63.0 | 58.0 | 50.4 - 66.7 |
| Paid partners | 82 | 25.0 | 23.3 | 16.1 - 31.2 |
| Paying partners | 61 | 18.8 | 17.3 | 10.0 - 22.2 |
| **Types of female partners in the last 6 months (n=83)** | | | | |
| Regular partners | 65 | 79.3 | 85.3 | 65.5-94.3 |
| Casual Partners | 35 | 42.7 | 43.9 | 30.8-77.5 |
| Paid partners | 27 | 32.1 | 37.4 | 12.8-42.1 |
| Paying partners | 14 | 17.1 | 37.1 | N/A |
| **Did not always use a condom with non-regular male partners in the last 6 months** | | | | |
| Casual partner (n=203) | 91 | 44.8 | 54.2 | 70.8-54.2 |
| Paid partners (n=80) | 32 | 40.0 | 49.2 | 82.1-49.2 |

| | | | | |
|---|---|---|---|---|
| Paying partners (n=67) | 36 | 53.7 | 49.5 | 89.4-49.5 |

[a] Crude percentages apply to study participants

[b] Adjusted percentages apply to study participants and MSM in their sexual networks

[c] 90% confidence interval

**Table 5: HIV knowledge and exposure to HIV prevention programs, MSM in Ha Noi, 2008.**

| | Crude[a] | | Adjusted[b] | |
|---|---|---|---|---|
| | N | % | % | 90% CI[c] |
| **HIV knowledge** (number and percentage answering correctly) | | | | |
| 1. You can tell if someone is infected with HIV just by looking at him/her? | 229 | 61.9 | 62.2 | 54 - 68.1 |
| 2. Having sex with only one faithful, uninfected partner reduces the risk of HIV transmission. | 294 | 80.3 | 74.2 | 64 - 77.7 |
| 3. One can get HIV if one shares meal with other | 326 | 88.35 | 89.4 | 86.7 - 93.7 |
| 4. Mosquitoes and other insect bites will transmit HIV. | 278 | 75.75 | 71.3 | 64.5 - 77.5 |
| 5. Using condom every time during sexual intercourse prevents HIV transmission. | 341 | 93.2 | 92.3 | 87 - 95.4 |
| Answered all 5 questions correctly | 144 | 39.2 | 34.0 | 26.4 - 40.4 |
| **Perceived risk, preventive behavior** | | | | |
| Feels he is at risk for infection with HIV? | 131 | 35.7 | 31.5 | 24.4 – 37 |
| Has had an HIV test and received the results | 207 | 57.5 | 46.4 | 39.3-53.9 |
| Has received free condoms in the last 12 months | 176 | 44.1 | 33.0 | 24.8 - 38.5 |
| Has received information on safer sex and drug use for MSM in the last 12 months | 215 | 54.2 | 45.5 | 37.4 - 52.1 |
| Attended activities for gay/MSM organized by government or non-government organizations in the last 12 months | 126 | 32.06 | 20.3 | 16.2 - 27.6 |
| **Sources of prevention information** | | | | |
| Television | 188 | 64.8 | 54.5 | 43.9-62.2 |
| Radio | 95 | 40.1 | 31.1 | 20.4-40.3 |
| Newspaper | 155 | 57.2 | 49.2 | 37.0-56.3 |
| Poster | 83 | 35.2 | 24.4 | 16.8-35.1 |
| Leaflet | 107 | 41.8 | 35.3 | 26.3-46.1 |
| Websites | 207 | 70.65 | 64.7 | 53.5-71.7 |
| Game shows | 36 | 17.4 | 6.6 | 3.5-11.1 |
| Peer Educator | 104 | 40 | 26 | 13.9-32.5 |
| Health Care Center | 94 | 38.4 | 24.5 | 15.0-30.2 |

| | | | | |
|---|---|---|---|---|
| Others | 31 | 15.9 | 15.7 | 7.5-28.8 |

[a] Crude percentages apply to study participants

[b] Adjusted percentages apply to study participants and MSM in their sexual networks

[c] 90% confidence interval

# CHAPTER V: A NATIONAL INTERNET SURVEY OF MEN WHO HAVE SEX WITH MEN IN VIET NAM


## Abstract

This study examined sociodemographic characteristics, sexual identities, and key indicators of HIV risk among Vietnamese MSM who use the Internet. An Internet survey was conducted from November 2008 to February 2009. A total of 2,640 eligible, unduplicated submissions had complete socioeconomic information, including 1,453 with complete sexual behavior information. Median age of respondents was 23 years. Nearly 80% had attended college, 63.4% self-identified as gay and 17.7% as bi-sexual, and 88% had gone on-line to contact other MSM in the last 12 months. During the past 6 months, 75.8% of the men had sex only with other men and 7.6% had sex with both men and women. Of these recently active MSM, 57.8% had more than one male partner and 72.1% had anal sex. Of the 717 reporting anal sex, 39.8% did not use a condom at last anal sex, particularly those who did not think they were at risk of HIV infection (adjusted prevalence ratio (aPR): 1.4; 95%CI: 1.1-1.6), and/or if the last anal sex partner was a regular partner (aPR: 1.5; 95%CI: 1.2-1.9). Vietnamese MSM are at very high risk of sexual HIV transmission. HIV prevention for MSM, including Internet-based programs, should be scaled up.

## Introduction

Worldwide, men who have sex with men (MSM) account for 5 - 10% of all HIV infections [47]. In recent years, Internet survey tools have been used to conduct research in hard-to-reach populations such as MSM, many of whom use the Internet for social interaction and finding partners [29-31]. In addition, in many different regions, Internet surveys have reached MSM with different sociodemographic characteristics and risk behaviors compared to MSM recruited by conventional methods [29,30,32-34,51,52].

In Viet Nam, an estimated 220,000 people were HIV infected by the end of 2007 [4]. Previous surveys have largely focused on Viet Nam's two major cities, Ha Noi (the capital) and Ho Chi Minh City (the largest city). The MSM in these studies tended to have low levels of education, self-identity as bisexual or straight, and were involved in commercial sex transactions [7-9].

Internet access has become widespread in Viet Nam. By June 2009, approximately one fourth of the Vietnamese population, or 21.5 million people, used the Internet [38]. As in other countries, the internet is believed to be a common venue for Vietnamese MSM to find sexual partners [10]. But data regarding Internet use by Vietnamese MSM are not available.

We conducted an Internet survey of Vietnamese MSM to help inform the development of effective HIV prevention interventions for this population. This article

describes the application of Internet survey methods to recruit Vietnamese MSM and presents sociodemographic characteristics, sexual identities, and key indicators of HIV risk among Vietnamese MSM who use the Internet.

**Methods**

Identical banner advertisements with embedded URL links to the questionnaire were posted on the five Vietnamese-language gay web forums identified by an Internet search and key informants, and on an Internet "blog" targeting Vietnamese MSM. The forums had between 22,000 to 79,000 registered users. The web forum administrators also posted a news release about the study and sent an email to their members inviting participation. An incentive of VND 10,000 (USD 0.7) per completed questionnaire was given to charities selected by the forum's owners.

Visitors who clicked on the study banner advertisement on a participating web site were taken to the study information page. After reading the study and consent information, they were asked to click the “Continue” button if they wanted to participate. The questionnaire began with three items that assessed whether the potential respondent met the eligibility criteria: 1) male living in Viet Nam; 2) age 18 years old or older; and 3) had sex with other male(s) in the last 12 months (regardless of the respondent's own sexual orientation or identification). The first "no" answer to any of these questions took the visitor to a “Thank you” page and concluded the survey.

While answering the questionnaire, the respondent could go back to change answers to previous questions. However, a respondent could not return to complete the questionnaire from where he left off if the browser was closed for any reason.

The study questionnaire covered the following topics: sociodemographic characteristics, sexual identity, sexual preference, concealment of homosexuality, self-esteem, gender non-conformity, social support, sexual risk behavior including partner seeking practices, condom use, knowledge about HIV and AIDS, perception of HIV risk, and access to HIV/AIDS prevention interventions. The questions on demographic characteristics, sexual behaviors, and exposure to HIV prevention were modified from the Behavior Sentinel Surveillance questionnaire [39]. HIV knowledge was assessed with five questions used in the report of the United Nations General Assembly Special Session on HIV (UNGASS) [2].

The questionnaire was developed in English and then translated into Vietnamese. To ensure the quality of translation, an independent translator was hired to translate the questionnaire back into English. Explanations and slang terms were provided for words that might be unfamiliar. After testing, the questionnaire was piloted in Ha Noi and Ho Chi Minh City with different groups of MSM. Prior to the Internet survey, the questionnaire was used for a survey in Ha Noi which employed respondent driven sampling (in preparation) and was then slightly modified. The questionnaire took 30 minutes to 1 hour to complete, depending upon the Internet connection speed and the respondent's individual computer skills. The

Internet survey tool (Qualtrics®) was easy to use, though, if the survey platform encountered an error condition, the message appeared only in English, which could have prevented some respondents from completing the questionnaire.

Questionnaire responses were stored in firewall-protected computer servers in the United States. Data were downloaded as comma separated value (CSV) UTF-8 format files and then imported into and analyzed with SAS version 9.2 [44]. Potentially identifying information such as respondent's computer Internet protocol (IP) address and email address if provided were deleted before data were analyzed.

Submissions with identical values for 22 sociodemographic characteristics were considered to be duplicates. Within each pair or threesome of apparently identical submissions, the earliest was retained unless it was not complete and a later one was. A total of 28 apparent repeat submissions from among 2,668 submissions with completed sociodemographic characteristics were deleted.

Distributions of all variables were examined. Cross-tabulations were used to verify internal consistency of responses. We used log-binomial regression in SAS PROC GENMOD to estimate prevalence ratios [46] for associations between unprotected anal sex and various factors of interest. Univariate associations with p-values less than 0.15 were included multivariable models.

The study was approved by the University of North Carolina at Chapel Hill

Public Health-Nursing Institutional Review Board (IRB study number 08 – 0073) and conducted under general permission A-650 from the Viet Nam Ministry of Science and Technology.

## Results

From 28 October 2008 to 31 January 2009, 6,859 survey web forms were submitted. Of these submissions, 5,768 said they were from men living in Viet Nam; of these, 4,861 had respondent's age of 18 years or older, 3,595 reported sex with another man in the last 12 months, and 3,231 reported the respondent had not completed this Internet survey previously (e.g., from a different web site) and was therefore eligible for the survey (Table 6). Of eligible submissions, 2,640 (81.7%) contained complete sociodemographic information and were apparently not repeat submissions. Since the questionnaire did not permit respondents to skip questions, the number of responses declined for each successive section of the questionnaire, with 1,453 respondents (44.9% of apparently eligible submissions) having complete information on sexual behavior.

## Sociodemographic characteristics

The 2,640 respondents were young (median 23 years) and well-educated. Nearly 80% had enrolled in or completed an undergraduate degree, including 11% with some postgraduate education (not shown). The majority of respondents (62.3%) were from Ho Chi Minh City. Remaining respondents resided in Ha Noi (11.9%), or in one of 49 provinces and cities out of Viet Nam's 63 provinces/cities. The great

majority of respondents (86%) had never married. Nearly 60% of respondents were living with their parents or siblings at the time of answering the questionnaire. Almost 80 percent of respondents had a monthly income of USD 60, the approximate mean income for urban Vietnamese men [39], or above. Only 4.8% of respondents reported that they were unemployed. A very small percentage (1.5%) of respondents reported their main income source was from trading sex. (Table 7)

**Sexual identity, sexual preference, and disclosure of sexual identity**

Nearly 90% (2,340) of respondents completed the sexual identity section of the questionnaire. Of those, 63.4% self-identified as gay men (người đồng tính); 17.7% self-identified as bi-sexual (lưỡng tính). About 11% of respondents indicated that they were "open-minded" (cởi mởi) or "questioning" (chưa xác định), and 3.8% identified themselves as "straight" (dị tính). (Table 8) A fourth of respondents thought they were somewhat or definitely effeminate.

Ninety-two percent of respondents were attracted only to men or preferred men to women as sexual partners. A small number of respondents (0.5%) said they preferred women as sexual partners. Men who self-identified as straight were less likely to describe themselves as effeminate and to prefer only men as partners (not shown). Slightly more than half (55.4%) of respondents had disclosed to people important to them that they had sex with other men. Almost one-third of respondents (32.3%) said they were definitely "in the closet" (hoàn toàn bí mật), approximately another third said they were “in the closet” most of the time (gần như là bí mật), and

one fourth said they were "half in and half out" (lúc bí mật, lúc công khai). Only a very small percentage (5.6%) reported that they were “out of the closet” most of the time (hoàn toàn công khai).

**Internet use and partner seeking patterns**

Of those who completed the sociodemographic section of the questionnaire, about 61% (1,621) completed the section on social and sexual networking. Large majorities of these respondents said they used the Internet daily(84%) and had used the Internet to contact other MSM in the last month (88%) (Table 9). A considerable proportion (42%) of respondents said they had never been to a public place known as a venue for MSM. Among respondents who had, coffee shops (65%) and bar/discos (61%) were the most popular.

Among respondents who looked for male sexual partners in the last year, looking for partners via the Internet was more than twice as common (85%) as using one's circle of friends (39%). Among respondents who looked for a male partner in the past year, 65% listed the Internet as their favorite place. Although only 27.9% of respondents met their first male sexual partner on the Internet, 44.9% met their most recent sexual partner through that medium.

**Sexual behaviors**

To assess the possibility of bias from attrition as respondents proceeded through the survey, we compared available information for the 1,453 respondents

who completed the sexual behavior section (near the end of the questionnaire) with those who did not. The 1,187 respondents who completed the sociodemographic section but did not complete the sexual behavior section were slightly younger (mean age 23.7 years, vs. 24.7 for respondents who completed the sexual behavior section) and had somewhat less education and lower income. The largest difference was observed for the proportion of people living in locations other than Ha Noi or Ho Chi Minh City (31.8%, versus 20.0% for respondents completing the sexual behavior section). Of the 2,340 respondents who completed the sexual identity section, the greatest difference between the 887 who did not complete the sexual behavior section and those who did was that the former were less likely to describe themselves as "gay" (59.3% vs. 66.7%). Other sexual identity characteristics were similar.

The great majority (84.5%) of men who answered the sexual behavior section reported having had sex during the past 6 months, including 75.8% with only male partners and 7.6% with both male and female partners. Of these recently active MSM, 57.8% had more than one male partner and 72.1% had anal sex. Of the men reporting anal sex, 39.8% did not use a condom at last anal sex (Table 10).

Most (54.2%) of participants correctly answered all 5 questions regarding HIV transmission and myths. About two-thirds of participants correctly answered that they could not tell whether or not a person was HIV infected by looking at him or her.

A considerable proportion (41.2%) of participants considered themselves not to be at risk of HIV infection.

**Correlates of condom use**

Among those reporting anal sex in the past six months, significant correlates of not using a condom at last anal sex were monthly income under USD 30.0, never having been to an MSM venue, and low perceived personal risk of HIV infection. Unprotected anal sex was more likely in sex with a regular rather than a casual partner.

In multivariate analysis, respondents were more likely to have unprotected sex when they thought they were not at risk of HIV infection (prevalence ratio (PR): 1.4; 95%CI: 1.1-1.7). Respondents were also more likely to have unprotected sex with regular partners than with casual partners (PR: 1.5; 95 %CI: 1.2-1.9). Respondents who had never been to MSM venues were more likely to have unprotected sex, as were respondents with incomes below USD 30, though these associations had p-values above 0.05.

**Discussion**

We report results of the first national Internet survey of MSM in Viet Nam. Respondents, recruited through gay web sites, were predominantly young, highly educated, relatively affluent, urban residents, though about one in six was 30 years or older, about one in five had not attended college, and one in four lived outside of

Viet Nam's two largest cities. Respondents reported a diversity of occupations, with significant representation from government, business, the self-employed, and students.

Study respondents came disproportionately from Viet Nam's two largest cities, Ho Chi Minh City (population 7.1 million) and Ha Noi (3.4 million) [53] . Gay life is more visible in these cities, and Internet access is greater. However, one quarter of respondents came from smaller cities or rural areas throughout Viet Nam. Information about the geographical distribution of members was available for only one of the websites. The majority of members of that website were also from Ho Chi Minh City (42%) and Ha Noi (33%) [54], suggesting that our respondents at least from that website (36% from Ho Chi Minh City and 21% from Ha Noi) were less skewed toward Vietnam's two largest cities.

Study respondents identified themselves primarily as gay or bisexual, though nearly one-in-five chose some other descriptor (e.g., questioning, open-minded, or straight). Contradicting a common belief in Viet Nam that MSM are effeminate, the proportion of males in our study who considered themselves effeminate was rather small. However, we do not know how others would perceive the respondents. This study does support the common belief that most MSM in Viet Nam usually hide their sexual identities.

Nearly one in ten of our respondents reported having sex with women, and about half of these men were married. These men may be acting in response to the stigma against homosexuality and to the pressure to marry and continue the family line. However, by having sex with women, MSM may be exposing their female partners to HIV and thereby serving as a bridge for HIV transmission from a high risk group to the general population.

The proportion of respondents living by trading sex was much smaller than has been reported in other studies on MSM in Viet Nam (range 23% - 41%) [7-9]. The proportions of MSM in our study who had sex with women or preferred women as sexual partners were smaller than the corresponding proportions from 22% to 40% reported by venue-based studies in Viet Nam [7-9]. The differences presumably reflect our study's reliance on recruitment through gay web sites and altruistic motivation in contrast to venue-based sampling and direct monetary incentives. The higher proportions of bisexual and heterosexual men in the venue-based studies may be partly due to the higher proportion of MSM selling sex for money (about one-third) in those studies. Importantly, both the venue-based studies and our own are in agreement that Vietnamese MSM engage in behaviors placing them at high risk of acquiring or transmitting HIV, such as having more than one partner, having sex with casual partners, and having unprotected anal sex.

As other studies on MSM [55], our study shows that the respondents were more likely to have unprotected anal sex with a regular partner. We did not ask about HIV

status of partners of respondents, so we do not know if the greater frequency of unprotected anal sex with regular partners reflects concordant HIV status. Further studies are needed to explore the reasons for unprotected anal sex among MSM in Viet Nam. Given the fact that MSM had many partners and the proportion of unprotected sex was high, HIV prevention programs should emphasize the message of consistent condom use with all types of partners.

The low perceived personal risk of HIV infection on the part of MSM who engage in unprotected anal sex is a significant concern. Low perceived risk could reflect ignorance about the risk of HIV transmission in male-to-male sex. This possibility should be investigated, HIV prevention interventions could have specific messages about this risk.

Because this study defined MSM as men who had any type of sex (oral, anal, or mutual masturbation) with another man in the last year, our study included sizable proportions of MSM who did not report anal sex with other men. Reducing the number of sexual partners and avoiding unprotected anal sex are measures promoted to prevent HIV transmission. Further studies are needed to ascertain if Vietnamese MSM who avoid having multiple partners or anal sex do so to protect themselves or for other reasons, and how to encourage other Vietnamese MSM to use these personal HIV prevention strategies.

Our study has demonstrated that the Internet is a feasible and productive survey modality in Viet Nam. With a combination of passive methods (advertising banner on gay websites) and active methods (sending email invitations and reminders to members of gay websites), the study was successful in recruiting a large number of MSM throughout Viet Nam in a period of four months. The Internet survey reached an MSM population not accessible by recruitment methods often employed for relatively small, hard-to-reach populations. For example, the more than 40% of our respondents who had never frequented venues for MSM could not have been reached through venue-based or time-location recruitment. Similarly, the 12% of respondents who reported not having contact with any other MSM in the last month would not have been recruited through a network-based method such as respondent-driven sampling. The Internet survey therefore made it possible to reach unstudied segments of the MSM population, including MSM with higher educational levels and better employment status. The self-administered, anonymous, Internet-based questionnaire also avoided interviewer bias and should have reduced social desirability influences. Same-sex behaviors are still taboo in Viet Nam's relatively conservative culture, and the Internet survey allowed MSM to participate at a time and location of their choice.

The major limitations of this study are respondent self-selection and the lack of a sampling frame. To participate in the study, respondents must have had access to the Internet and have visited a gay website, which probably contributed to our study's greater representation of young, educated, and urban MSM. Although our

results likely apply to a significant fraction of Vietnamese MSM, statistical generalization to all MSM in Viet Nam or even all Internet-using Vietnamese MSM is not possible. Other recruitment methods and shorter surveys may succeed in obtaining a greater representation of less-educated, less affluent, married MSM who use the Internet. Nevertheless, the present survey provides sufficient evidence of the importance of HIV education and intervention for online MSM and provide data that can help dispel the myths surrounding MSM in Viet Nam.

In order to make the survey more user-friendly, each question of the survey was put on a single web page to increase page loading speed, the interface was designed to look neutral, and the wording of the questionnaire was carefully chosen. Nevertheless, most of persons opening the survey did not complete some of it. Some of these incomplete submissions could represent "robots" (computer programs that index web pages or to send spam via web forms). However, many potential respondents may have discontinued the questionnaire due to its length, other aspects of the questionnaire, slow Internet response times, or other reasons. The option of having a larger incentive to attract online respondents should be further explored. Presenting the different sections of the questionnaire in random order might balance the numbers of respondents to each section.

Our study documents that MSM reside throughout Viet Nam, work in many occupations and professions, are largely indistinguishable from their heterosexual countrymen, and are at high risk of acquiring HIV. The successful use of Vietnamese

gay web sites for this survey suggests that these sites might be used as channels for educational and other HIV prevention interventions. Online interventions, such as information dissemination, question-and-answer forums, advertisements for HIV services, and participation by health care workers in Internet chat rooms on these websites, are increasingly used by AIDS service organizations in the US [56]. Such interventions are feasible and effective in reducing risk behaviors among MSM [57,58]. The successful collaboration with websites owned by members of the Vietnamese MSM community, a collaboration that was essential to the present study, could be further developed, and strengthened for other activities, including HIV prevention.

**Table 6: Survey submissions received, by eligibility status and sections completed. The MSM Internet survey in Viet Nam, 2008-2009.**

| Eligibility status and sequential questionnaire sections completed by eligible respondents | Number of completed submissions |
|---|---|
| Opened the survey (agreed to participate) | 6,859 |
| Men living in Viet Nam | |
| Not answered | -441 |
| Not eligible | -650 |
| Eligible | 5,768 |
| 18 years and older | |
| Not answered | -287 |
| Not eligible | -620 |
| Eligible | 4,861 |
| Had sex with other men in the last 12 months | |
| Not answered | -137 |
| Not eligible | -1,129 |
| Eligible | 3,595 |
| Not participated in this Internet survey before | |
| Not answered | -68 |
| Not eligible | -296 |
| Eligible | 3,231 |
| Sociodemographic information | 2,640 |
| Sexual identity | 2,340 |
| Self esteem | 2,235 |
| Social support | 2,062 |
| Internalized homophobia | 1,814 |
| Enacted stigma | 1,715 |
| Social and sexual networking | 1,621 |
| Sexual behavior | **1,453** |
| Condom and lubricant use | 1,443 |
| HIV knowledge and risk perception | 1,428 |
| Alcohol and drug use | 1,424 |
| Access to HIV preventive services | 1,399 |

**Table 7: Respondent ociodemographic characteristics. The MSM Internet survey in Viet Nam, 2008-2009.**

| | N =2,640 | % |
|---|---|---|
| **Age group (years)** | | |
| 18-19 | 631 | 23.9 |
| 20-24 | 1,024 | 38.8 |
| 25-29 | 514 | 19.5 |
| >30 | 471 | 17.8 |
| Mean (excluding age > 55) | 24.2 | |
| Median | 23 | |
| **Education level** | | |
| Not finished high school | 81 | 3.1 |
| Finished high school | 482 | 18.3 |
| Some university or higher | 2,077 | 78.7 |
| **Residence location** | | |
| Hà Nội | 312 | 11.9 |
| Hồ Chí Minh | 1,640 | 62.3 |
| Others | 681 | 25.9 |
| **Marital status** | | |
| Never married | 2,270 | 86.0 |
| Married | 151 | 5.7 |
| Divorced/ Separated/ Widowed | 56 | 2.1 |
| Other | 163 | 6.17 |
| **Income per month** (in USD) | | |
| <30 | 322 | 12.3 |
| 30 - <60 | 248 | 9.4 |
| 60 - <120 | 606 | 23.1 |
| 120 - < 300 | 776 | 29.5 |
| > 300 | 676 | 25.7 |
| **Main sources of income*** (multiple responses permitted) | | |
| Farmer | 16 | 0.6 |
| Government officer | 348 | 13.2 |
| Staff of entertainment venue | 211 | 8.0 |
| Office worker /Sales clerk | 608 | 23.0 |
| Businessmen | 345 | 13.1 |
| Student | 1,001 | 37.9 |
| Self-employed | 366 | 13.9 |
| Sex worker | 40 | 1.5 |
| Unemployed | 126 | 4.8 |
| Other | 268 | 10.2 |

**Table 8: Sexual identity characteristics. The MSM Internet survey in Viet Nam, 2008-2009.**

| Characteristic | N | % |
|---|---|---|
| Minimum N | 2,340 | |
| **Sexual Identity** | | |
| Gay | 1,673 | 63.4 |
| Bi-sexual | 468 | 17.7 |
| Transsexual | 16 | 0.6 |
| Open Minded | 169 | 6.4 |
| Questioning | 161 | 6.1 |
| Straight | 140 | 5.3 |
| Other | 13 | 0.5 |
| **Sexual preference** | | |
| Attracted only to men | 1,397 | 53.2 |
| Attracted more to men than to women | 962 | 36.6 |
| Attracted equally to men and women | 220 | 8.4 |
| Attracted more to women than to men | 36 | 1.4 |
| Attracted only to women | 13 | 0.5 |
| **Considered yourself to be effeminate** | | |
| Definitely Yes | 64 | 2.5 |
| Somewhat Yes | 548 | 21.7 |
| Somewhat No | 1,525 | 58.9 |
| Definitely No | 453 | 17.5 |
| **Disclosed sexual identity** | | |
| Ever | 1,428 | 55.4 |
| Never | 1,152 | 44.6 |
| **Considered yourself to be "in the closet"** | | |
| Definitely in the closet | 796 | 32.3 |
| In the closet most of the time | 861 | 34.9 |
| Half in and half out | 616 | 25.0 |
| Out of the closet most of the time | 130 | 5.3 |
| Completely out of the closet | 62 | 2.5 |

**Table 9: Internet use, personal network, and partner-seeking patterns of Vietnamese MSM. The MSM Internet survey in Viet Nam, 2008-2009.**

| | N | % |
|---|---|---|
| **Frequency of Internet use** | | |
| Every day | 1,224 | 84.2 |
| At least once a week | 200 | 13.8 |
| At least one a month | 29 | 2 |
| **The number of MSM that you knew and contacted in the last month** | | |
| 0 | 182 | 12.6 |
| 1 | 228 | 15.8 |
| 2-5 | 611 | 42.3 |
| 6-10 | 225 | 15.6 |
| >10 | 198 | 13.7 |
| **Have you ever frequented an MSM venue (bar, café, sauna...)** | | |
| Yes | 771 | 53.1 |
| No | 624 | 42.9 |
| Don't know | 58 | 4.0 |
| **Places you have visited to find male sex partners in the last 12 months** (multiple responses permitted) | | |
| At your school/university/workplace | 190 | 19.7 |
| In the street or park | 96 | 10.0 |
| In the bar or disco | 127 | 13.2 |
| In the cinema | 35 | 3.6 |
| In the swimming pool | 125 | 13.0 |
| Through an intermediary/pimp | 24 | 2.5 |
| In a sauna/massage parlor | 171 | 17.7 |
| Coffee shop | 95 | 9.9 |
| Through circle of friends | 379 | 39.3 |
| On the Internet | 823 | 85.4 |
| Other | 27 | 2.8 |

**Table 10: Sexual behaviors in the last 6 months.[a] The MSM Internet survey in Viet Nam, 2008-2009.**

| | N | % |
|---|---|---|
| **Gender of sexual partners** | | |
| Had sex only with male partners | 1,102 | 75.8 |
| Had sex with both male and female partners | 111 | 7.6 |
| Had sex only with female partners | 14 | 1.0 |
| Did not have sex in the last 6 months | 226 | 15.6 |
| **Engaged in oral sex** | | |
| Yes | 1,155 | 95.2 |
| No | 59 | 4.8 |
| **Had anal sex with other men** | | |
| Yes | 800 | 72.1 |
| No | 309 | 27.9 |
| **Number of male sexual partners** | | |
| 0 | 247 | 17.0 |
| 1 | 509 | 35.0 |
| 2-5 | 523 | 36.0 |
| 6-10 | 101 | 7.0 |
| >10 | 73 | 5.0 |
| **Types of male partners** (multiple responses permitted) | | |
| Regular partners | 837 | 69.0 |
| Casual partners | 644 | 53.1 |
| Paid partners | 147 | 12.1 |
| Paying partners | 92 | 7.6 |
| **Condom use at last anal sex with any partner** | | |
| Yes | 432 | 60.3 |
| No | 285 | 39.8 |

[a] These questions asked about the 6 months prior to the interview. All of these men reported sex with another man during the past year.

**Table 11: Associations with unprotected anal sex among 717 men reporting anal sex in the past 6 months. The MSM Internet survey in Viet Nam, 2008-2009.[a]**

| | Bivariate | | Multivariate | |
|---|---|---|---|---|
| | PR[b] | 95%CI[b] | PR[b] | 95%CI[b] |
| **Age group** | | | | |
| 18-19 | 1.0 | | | |
| 20-24 | 1.1 | 0.9-1.5 | | |
| 25-29 | 0.9 | 0.7-1.3 | | |
| >30 | 0.9 | 0.6-1.2 | | |
| **Education level** | | | | |
| Not finished high school | 0.5 | 0.2-1.3 | | |
| Finished High school | 1.0 | 0.8-1.3 | | |
| University or higher | 1.0 | | | |
| **Income per month (in USD)** | | | | |
| **<30** | 1.4 | 1.1-2.0 | 1.2 | 0.9-1.7 |
| **30 - <60** | 1.2 | 0.9-1.7 | 1.1 | 0.8-1.5 |
| 60 - <120 | 1.1 | 0.8-1.4 | 0.9 | 0.7-1.2 |
| 120 - < 300 | 1.0 | 0.8-1.3 | 1.0 | 0.8-1.3 |
| > 300 | 1.0 | | 1.00 | |
| **Marital status** | | | | |
| Single (Never married) | 1.0 | | | |
| Married | 0.8 | 0.5-1.4 | | |
| Divorced/ Separated/ Widow | 1.3 | 0.8-2.2 | | |
| Other | 1.1 | 0.8-1.6 | | |
| **Sexual Identity** | | | | |
| Gay | 1.0 | | | |
| Bi-sexual | 1.2 | 1.0-1.5 | | |
| Open Minded | 0.8 | 0.5-1.3 | | |
| Questioning | 1.0 | 0.6-1.7 | | |
| Straight | 1.2 | 0.8-1.8 | | |
| **Has been to venues for MSM (bar, cafe, sauna..)** | | | | |
| Yes | 1.0 | | 1 | |
| No | 1.2 | 1.0-1.5 | 1.2 | 1.0-1.4 |
| Don't know | 1.0 | 0.6-1.7 | 0.9 | 0.5-1.6 |
| **Do you think that you are at risk of HIV infection?** | | | | |
| Yes | 1.0 | | | |
| No | 1.5 | 1.2-1.8 | 1.4 | 1.1-1.7 |
| Don't know | 1.3 | 1.0-1.7 | 1.3 | 1.0-1.7 |
| **Correctly answered all 5 questions on HIV infection and prevention** | | | | |
| No | 1.0 | | | |
| Yes | 1.0 | 0.8-1.2 | | |

| | | | | |
|---|---|---|---|---|
| **Partner in last anal intercourse** | | | | |
| Casual partner | 1.0 | | 1.0 | |
| Regular partner | 1.5 | 1.2-1.9 | 1.5 | 1.2-1.9 |
| Paying partner | 1.0 | 0.4-2.6 | 1.0 | 0.4-2.7 |
| Paid partner | 0.7 | 0.4-1.4 | 0.7 | 0.4-1.5 |
| **Role in last anal intercourse** | | | | |
| Insertive | 1.0 | | | |
| Receptive | 1.0 | 0.8-1.2 | | |
| Both | 1.1 | 0.9-1.4 | | |

[a] Among 717 men who had anal sex with a man during the past 6 months.

[b] PR = prevalence ratio, 95%CI = 95% confidence interval

# CHAPTER VI: DISCUSSION

Our aims are to describe sociodemographic characteristics and sexual behaviors of MSM across Viet Nam. Results of our study will be used to assist government and donor organizations to develop and improve HIV prevention programs for MSM, to protect their health and limit the spread of HIV in Viet Nam.

## 6.1 Summary of results

Although both surveys attracted respondents from relatively young and highly educated MSM, the surveys confirm that MSM in Viet Nam are diverse in regard to age, education, income, and sexual identity. Respondents to the Internet-based survey came disproportionately from Viet Nam's two largest cities, Ho Chi Minh City (population 7.1 million) and Ha Noi (3.4 million at the time of the survey); one fourth came from smaller cities and rural areas throughout Viet Nam. Participants reported a range of occupations, with significant representation from government, business, the self-employed, and students. Respondents reported engaging in many behaviors that place them at risk of acquiring and transmitting HIV, such as having unprotected anal sex, having multiple partners, and having sex with both men and women. Perceived risk of HIV was low, and the proportion of MSM accessing HIV prevention services was small. Both the type of male partner and personal risk perception were significantly associated with condom use during anal sex.

## 6.2 Comparison of results from the two surveys

### 6.2.1 Sociodemographic characteristics and sexual identity

The use of two different sampling methods allowed us to reach different segments of the MSM population. Although some of the differences in responses between the RDS and Internet-based surveys reflect their different geographical scope, even among Ha Noi residents the two survey modalities drew from somewhat different populations. Ha Noi respondents to the Internet-based survey were younger, had better education, and had higher incomes than both the RDS respondents and the RDS-adjusted estimates for Ha Noi MSM. For example, 77.8% of Ha Noi MSM who responded to the Internet survey had attended university compared with the estimate of 60.3% from the RDS survey. However, both of these percentages are far higher than in previous studies in Viet Nam (range 5.6 – 38.8%) [7-9]. Similarly, 55.3% of Ha Noi Internet respondents reported monthly income above USD 120, compared to 26.1% from the RDS survey. Both of these percentages are also higher than in previous studies [7-9].

The proportion of married MSM in the Internet survey (5.5%) was somewhat higher than that in the RDS survey (1.7%), though both percentages are at the lower end of the range reported from countries in Asia (range 3-42%) [59].

The sexual identities of MSM respondents were diverse. Study participants primarily identified themselves as gay or bisexual, though some chose another

descriptor (e.g., questioning, open-minded, or straight). The proportions who identified themselves as bisexual were lower than in other surveys [7-9].

The present study is the first to examine gender nonconformity and sexual identity concealment of MSM in Viet Nam. Our results are consistent with the common belief that most MSM in Viet Nam as in other Asian societies hide their sexual identities. By contrast, the proportion of MSM in our study who considered themselves effeminate was rather small, which tends to contradict the common belief in Viet Nam that MSM are effeminate. We acknowledge, however, that we do not know how others would perceive the respondents.

The percentage of MSM keeping their sexual identity hidden was higher in the Internet survey than in the RDS survey, which may reflect the stronger stigma on MSM behavior in small cities and rural areas. The difference could also arise from the different recruitment methods, since in the RDS survey, respondents had to be identified as MSM by their recruiters. The reasons for and health impact of revealing or not revealing one's sexual identity should be studied. Our data document that there is a large invisible MSM population in Viet Nam.

### 6.2.2 Sexual risk behaviors

Both of our surveys observed a lower proportion of respondents living by trading sex, 0.3% in the RDS survey and 1.5% in the Internet survey, than has been reported in other studies on MSM in Viet Nam (range 23% - 41%) [7-9] as well as by

studies in other Asian countries (range 12% - 64 %) [59]. The percentages of MSM reporting having been paid for sex with a man during the past 6 months (7.6% in the Internet survey, 17.3% in the RDS survey) were also lower than in previous surveys in Viet Nam (range 21.8-40.7%) [7-10].

Nearly one in twelve (7.6%) of our online respondents and one in five (19%) of Ha Noi MSM studied in the RDS survey reported having sex with women. Both of these proportions are lower than in previous surveys in Viet Nam (range 22 - 40%) [7-9] and are at the lower end of the reports from other studies in Asia (range 11-98 %)[59].

Consistent with previous studies on MSM in Viet Nam, both the online and RDS surveys reported high proportions of MSM engaging in unprotected anal sex with male partners. Consistent condom use with different types of male partners ranged from 37-68% in the Internet survey and 45-50% in the RDS survey. The proportion of condom use at last MSM anal sex in the Internet survey was 60%, which is close to the high end of the range 31-75% reported by previous surveys in Viet Nam [7,39]

Like other studies on MSM in other countries [55], our online study shows that the respondents were more likely to have unprotected anal sex with regular partners. We did not ask about HIV status of respondents and their partners, so we do not know if the greater frequency of unprotected anal sex with regular partners reflects

concordant HIV status. Further studies are needed to explore the reasons for unprotected anal sex among MSM in Viet Nam. Importantly, both the venue-based studies and our own are in agreement that Vietnamese MSM engage in other behaviors placing them at high risk of acquiring or transmitting HIV, such as having more than one partner, having sex with casual partners, paid partners, and paying partners. Given the fact that MSM had many partners and the proportion of unprotected sex was high, HIV prevention programs should emphasize the message of consistent condom use with all types of partners.

The proportion of MSM in the Internet survey who answered all five questions on HIV transmission and prevention correctly was higher than the corresponding proportion of MSM in the RDS survey, consistent with the differences in educational level. Internet survey participants also were more likely to perceive themselves to be at personal risk of HIV infection. The significant association between low perceived personal risk of HIV and engaging in unprotected anal sex may reflect lack of knowledge on the part of MSM about the risk of HIV transmission in male-to-male sex. The lack of specific HIV prevention interventions for MSM may account for the low perception of risk, and perhaps protective measures could be increased by correcting risk perception.

In univariate analysis, online participants who searched for partners only on the Internet were more likely to have not used a condom the last time they had anal sex than those who have been to venues for MSM. However, the association was

not statistically significant in multivariate analyses. One possible explanation is those who only searched for partners on the Internet might have more casual partners than those who search for partners in both ways.

In both of our surveys, the Internet emerged as the most common place to look for male partners. Even the RDS study found Internet use to be very common; 94% reported using the Internet at least once a week. As would be expected, looking for partners on the Internet was more common (68.1%) in the Internet survey than in the RDS survey (34.5%).

The proportion of MSM who said they had ever received an HIV test and knew the test results was higher for the RDS survey (46.4%) than for the Internet survey (31.5%), and both proportions were much higher than those in previous surveysin Viet Nam (range 2.8-7.1%) [9]. There have been a number of HIV prevention intervention programs for populations at greatest risk in Viet Nam, but few of programs have been specifically designed for MSM. Our results suggest that HIV prevention interventions for MSM were not widely known among the target population or that there were barriers to accessing them even for these well-educated MSM. Therefore, HIV prevention services that attract more members of this high risk population are needed.

Because this study defined MSM as men who had any type of sex (oral, anal, or mutual masturbation) with another man in the last year, our study included sizable

proportions of MSM who did not report anal sex with other men. Reducing the number of sexual partners and avoiding anal sex are measures promoted to prevent HIV transmission. Further studies are needed to explore if these Vietnamese MSM did not have partners or did not have anal sex to protect themselves or for other reasons, and how to encourage other Vietnamese MSM to use these personal HIV prevention strategies.

## 6.3 Limitations of the research

### 6.3.1 Recall and reporting

As in other studies which assess reported behaviors, our results are subject to recall and social desirability biases. In order to reduce recall bias, we recruited only men who reported having sex with another man in the last year, and we asked about sexual behaviors during a relatively short recall period (6 months and last sexual encounter). We believe that the computer-based interview helped to avoid interviewer bias and to make respondents more willing to answer sensitive questions regarding their risk behaviors.

### 6.3.2 Recruitment

Each of the recruitment methods we used has its own weaknesses. The major limitations of Internet-based recruitment are respondent self-selection and the lack of a sampling frame. Respondents must have had access to the Internet and have visited a gay website. Our respondents almost certainly had better access to computers and the Internet and better Internet skills than the average Vietnamese

MSM. For the RDS survey, both recruitment and statistical adjustment are based on respondents' personal networks. The greater representation of young, educated MSM in Ha Noi, although similar to that from a previous study in this population [9], suggests that the networks through which MSM were recruited for our study are segregated by age and education.

Although our results likely apply to a significant fraction of Vietnamese MSM, statistical generalization to all MSM in Viet Nam is not possible. Other recruitment methods and shorter surveys may succeed in obtaining a greater representation of less educated, less affluent, and married MSM who use the Internet. Nevertheless, the present surveys provide sufficient evidence for the importance of HIV education and intervention for MSM.

### 6.3.3 Assessment of eligibility

The small monetary incentive paid to RDS survey respondents was apparently sufficient to tempt some non-MSM to pretend that they were eligible in order to take the survey. For this reason we screened potential RDS respondents to verify eligibility and in fact detected several men who pretended to have had sex with another man. Some non-MSM may not have been detected. In the Internet survey we relied totally on respondents' truthfulness in answering the eligibility questions. However, the incentive payment in the Internet survey was not made to the respondent, so there was no particular reason for a non-MSM to pretend to be eligible.

### 6.3.4 Issues with anonymous Internet surveys

In order to make the survey more user-friendly, each question of the Internet survey was put on a single web page to increase page loading speed, the interface was designed to look neutral, and the wording of the questionnaire was carefully chosen. Nevertheless, the majority of persons opening the survey did not complete most of it. Some of these incomplete submissions could represent "robots" (computer programs that index web pages or send spam via web forms). However, many potential respondents may have discontinued the questionnaire due to its length, other aspects of the questionnaire, slow Internet response times, or other reasons. A technological means of alleviating this problem would be to vary the order in which the different sections of the questionnaire are presented, so that the number of respondents would be more even across the various questions and the assumption that unanswered questions were missing at random would be more tenable.

The Internet survey tool used for this study was for the most part easy to use. However, if the survey platform encountered an error condition, the message appeared only in English, which could have prevented some respondents from completing the questionnaire.

### 6.3.5 Issues with RDS surveys

There is no reliable method with RDS to evaluate the true refusal proportion of potential respondents. Furthermore, we observed that some respondents received

more than one coupon from different recruiters. However, we did not know how many times this situation may have occurred or what that might imply for the RDS adjustment.

RDS adjustment requires knowing the size of the personal network of each respondent [21]. However, network size has been measured in different ways in different studies. In our study, we revised the question from that used in the IBBS by adding other types of personal contacts, such as through mobile phone and online chatting. It occurred to us that counting the number of individuals whom someone contacted in the previous month might not truly reflect the magnitude of someone's personal network, as some people might have too many contacts to remember, while others might not have contacted anyone during the recent months for some reason even though they have MSM associates. Further work on these issues will be important to build confidence in the use of the RDS method.

### 6.4 Strengths of the research

Our research shows that new methods of MSM recruitment, such as Internet surveys and RDS, are feasible and productive modalities in Viet Nam. With a combination of passive (advertising banner on gay websites) and active techniques (sending email invitations and reminders to members of gay websites), the online study was successful in recruiting a large number of MSM throughout Viet Nam in a period of four months. The Internet survey reached an MSM population not accessible by recruitment methods often employed for relatively small, hard-to-reach

populations. For example, the more than 40% of our respondents who had never frequented venues for MSM could not have been reached through venue-based or time-location recruitment. Similarly, the 12% of respondents who reported not having contact with any other MSM in the last month would not have been recruited through a network-based method such as respondent-driven sampling. The Internet survey therefore made it possible to reach unstudied segments of the MSM population, including MSM with higher educational levels and better employment status.

The RDS survey recruited over 400 MSM in Ha Noi during a 16-week period. Participants came to the study office with a referral coupon or invitation letter and successfully self-administered a web-based questionnaire after minimum instruction by researchers. The number of recruitment waves exceeded the required number to reach equilibrium for estimates of principal sociodemographic and sexual identity characteristics.

By having respondents self-administer the questionnaire through an internet web form, our study may have avoided interviewer bias and social desirability influences. Same-sex behaviors are still taboo in Viet Nam's relatively conservative culture. The Internet survey that used Internet recruitment had the additional advantage of allowing MSM to participate at a time and location of their choice.

## 6.5 Public health implications

Our results have a number of implications for HIV prevention interventions for MSM in Viet Nam. First, interventions should not be confined to the major cities, since MSM reside throughout the country. Second, HIV and sexual health education for young teenagers should include information on MSM and risk of HIV infection, since a large proportion of MSM first had sex with a man before age 18 years, and in many cases before age 16 years. Third, not all MSM identify themselves as "gay" or "bisexual", so interventions must consider MSM who characterize themselves in other ways, including those who identify themselves as ‘”straight”. Fourth, Vietnamese gay websites should be regarded as potential channels for educational and other HIV prevention interventions. Online interventions, such as information dissemination, question-and-answer forums, advertisements for HIV services, and participation by health care workers in Internet chat rooms on these websites, are increasingly used by AIDS service organizations in the US [56]. Such interventions are feasible and effective in reducing risk behaviors among MSM [57,58]. The successful collaboration with websites owned by members of the MSM community, a collaboration that was essential to the present study, could be further developed and strengthened for other activities, including HIV prevention.

## 6.6 Future research directions

In future analyses of the data from these studies we plan to examine the magnitude of social support, stigma, and discrimination towards MSM in Viet Nam and associations of these factors with sexual risk behaviors.

Our study did not measure HIV status of participants. The few published studies in Viet Nam suggest that HIV prevalence among MSM in Ha Noi and Ho Chi Minh City is relatively high. However, a study in Khanh Hoa did not detect any HIV positive men. In order to better understand the HIV epidemic among MSM in Viet Nam, HIV status and presence of other STIs should be measured in future studies. Detection of HIV and STI among online study participants presents special challenges, but possibilities should be explored.

We assessed sexual risk behaviors of MSM in the last six months, but the questions in our survey did not distinguish consecutive and concurrent sexual relationships. Given the potential importance of concurrent sexual partnerships in disseminating HIV in other countries, future research should look at concurrent sexual relationships among MSM in Viet Nam.

New methods to access the MSM population should be explored. For example, the possibility of using the Internet or SMS messaging (via mobile phones) to send RDS coupons has been proposed.

### 6.7. Conclusion

The HIV epidemic among MSM in Viet Nam is still at a relatively early stage in comparison to the double-digit seroprevalences reached in MSM in countries such as the U.S. Understanding the context of MSM activity in Viet Nam may make it

possible to adapt effective HIV prevention interventions from other settings and thereby prevent the escalation of HIV seroprevalence among Vietnamese MSM with dissemination to the rest of the Vietnamese population.

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